AAR develops **rail test car** that costs less, weighs less, and goes everywhere . . . p. 17

August 7, 1961

RAILWAY AGE WEEKLY

Will Weakened Railroads Cripple The Defense Effort?

. . . p. 14

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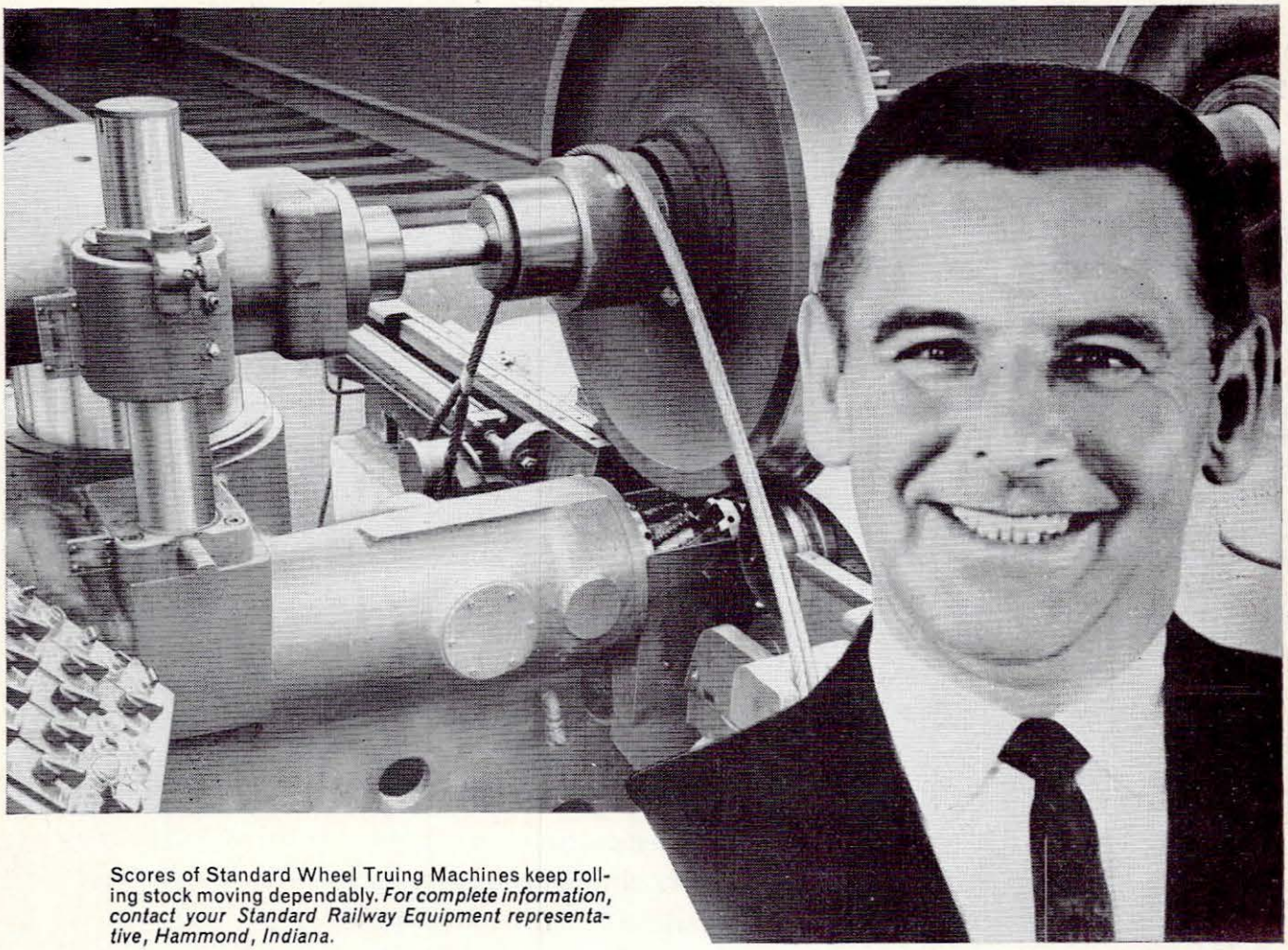

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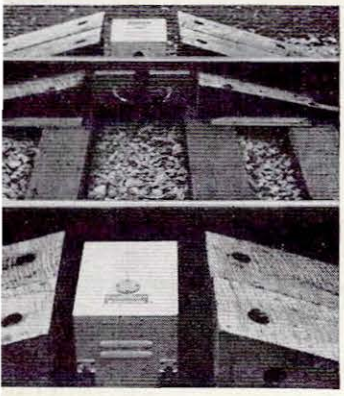

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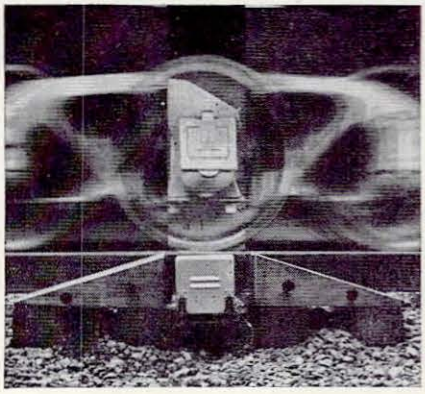

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RAILWAY AGE

WEEK AT A GLANCE

Aug. 7, 1961 • Vol. 151, No. 6

ATSF fears monopoly in West

In pressing its own bid for control of WP, Santa Fe told an ICC hearing that the rival bid of SP "does not provide for rail competition" between major centers ..... **p. 9**

L&N uses throw-away filters

Air filtration costs for Louisville & Nashville locomotives are being cut in half by use of disposable glass-fiber pads in place of permanent panel-type filters **p.13**

Will weakened railroads cripple the defense effort?

More defense means more rail traffic. Can railroads handle it? There's disturbing room for grave doubt—unless Congress acts fast to correct old inequities **p.14**

AAR rail test car uses tracks or highways

A rail-testing vehicle that weighs less, costs less, and goes wherever there is a track or a road, uses transistorized components to fit equipment into limited space **p.17**

CTC cuts train times

Traffic control, with reversible running, is helping the Santa Fe cut one to three hours off train schedules on its new Arizona line relocation **p.30**

Hutchinson urges coordination

Complete rail-highway coordination, via joint-rate and through-route arrangements, will provide "the type of flexible service the public has a right to expect," says the ICC chairman. **p.37**

REB offers supervisors' course

Railway Educational Bureau's 24-unit course of instruction gives supervisors (or those preparing for supervisory work) a new self-help tool **p.38**

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The Action Page—Costs for competition

Here's a simple example of how railroads and public alike can be hurt by insistence on using "fully distributed costs" as a "floor" for setting competitive rates p.42

Short and Significant

New York's 'full crew' laws . . .

are being tested in the state Supreme Court by 10 railroads. They claim "excess" crewmen cost them $12 million a year, giving their competitors an "unconstitutional" advantage.

Purchase of 600 piggyback cars . . .

for delivery in the third quarter has been authorized by the Trailer Train Co. board of directors. The new order will bring the TTX car fleet to 7,878 units.

A $5,000,000 loan to the Monon . . .

has been guaranteed by the ICC. Part of the money will go toward construction of a rail-marine terminal at Michigan City, Ind., and a barge-rail transfer facility at Louisville.

Responsibility for a report on transportation . . .

has been handed to Secretary of Commerce Luther H. Hodges. President Kennedy set a Nov. 1 date for "recommendations which could be made at the next session of Congress."

Railroads were not especially mentioned . . .

in the President's letter, but sources at the White House and Commerce Department feel the study will be heavily oriented to rail problems.

A $5,000,000 loan for the bankrupt New Haven . . .

has been guaranteed by the ICC, and approved by the court having custody of the railroad. The money will, in effect, provide cash and working capital for operating expenses.

Current Statistics

Operating Revenues	
5 mos., 1961	$3,622,223,954
5 mos., 1960	4,065,436,192
Operating expenses	
5 mos., 1961	2,982,789,099
5 mos., 1960	3,196,180,433
Taxes	
5 mos., 1961	392,280 875
5 mos., 1960	450,431,799
Net railway operating income	
5 mos., 1961	86,601,151
5 mos., 1960	273,539,570
Net income estimated	
5 mos., 1961	17,000 000
5 mos., 1960	195,000,000
Carloadings revenue freight	
29 wks., 1961	15,174,189
29 wks., 1960	17,374,201
Freight cars on order	
July 1, 1961	11,821
July 1, 1960	29,555
Freight cars delivered	
6 mos., 1961	18,782
6 mos., 1960	31,402

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ATSF Fears Monopoly in West

► **The Story at a Glance: Santa Fe's No. 2 billing (chronologically) in the Western Pacific control case hearings doesn't appear to have lessened the impact of ATSF's presentation. President E. S. Marsh, Santa Fe's first principal witness, ranged far and wide in his testimony to rebut many of the major points made by Southern Pacific witnesses in eight days of testimony. From there, Santa Fe went on to present a variety of witnesses—railroad officers and outside experts—in its attempt to prove that the West needs inter-railroad competition, and that this can be provided only if ATSF is permitted to assume control of Western Pacific. SP, which opened its case before ICC Examiner Paul C. Albus July 17, had stressed the economies and efficiencies which might be possible under SP control of WP.**

Almost every shot being fired by Santa Fe in its fight for WP is aimed at one target: the preservation of rail competition in the fast-growing West. ATSF witnesses see the threat of monopoly in conditions they say could exist should WP go under Southern Pacific control. SP's argument, that other modes of transport are the railroads' chief competitors, isn't bought for a minute by Santa Fe.

So far as ATSF President Marsh is concerned, "the area in question already has almost the irreducible minimum of rail competition"—two competitive routes between San Francisco and the Utah Gateway; two between California and the Pacific Northwest; and two between northern and southern California.

Most of the area served by WP, Mr. Marsh argued, "is growing vigorously and for the foreseeable future will experience an increasing demand for all forms of transportation service. It cannot afford to be deprived of benefits that flow from competition of two strong rail systems."

Santa Fe's president charged that "Southern Pacific control [of WP] does not provide for rail competition between the principal centers of population or between the principal gateways in the territory involved. . . . In my opinion, the public would be paying too high a price for such savings as might be realized by any substantial shrinkage of the rail plant in this area by various forms of coordination and elimination of duplications, even if those savings could be achieved in no other way."

Under present conditions, with "the cold war, increasing world tensions and military buildup," he asked, "should we entertain the thought of shrinking the capacity of western transcontinental railroads? . . . Our philosophy on Santa Fe is to take an affirmative view and do everything we can to build up the volume of railroad business so as to attain greater utilization of the capacity of the plant."

During presentation of SP's case, witnesses looked dimly on the possibility that Santa Fe might siphon traffic from the Utah Gateways in favor of its own rails through the Arizona Gateway between California and the East. Mr. Marsh denied that Santa Fe plans any such move. Conditions which ATSF has agreed to, he declared, will protect routes and carriers participating in these routes from "any disruption of existing traffic arrangements." Moreover, he said, "Santa Fe's own self-interest provides a guarantee against any undertaking on our part to prejudice the Western Pacific route through Salt Lake City. Santa Fe would not be investing millions of dollars in

ACL-SAL Merger Hearings End

ICC hearings on the proposed merger of Atlantic Coast Line and Seaboard Air Line ended in Richmond July 28, eight months to the day (and 5,000 pages of testimony) after they opened in the same city. In the interim, ICC Examiner Hyman J. Blond roamed far and wide over the South (Tampa, Savannah, Montgomery, Atlanta, Miami and Washington) to hear the pro and con arguments of intervenors.

Rebuttal statements by presidents of the merger-minded roads were the final entries in the transcript record.

Both chief executives—Coast Line's W. T. Rice and Seaboard's J. W. Smith—firmly rejected one proposed merger condition: that the merged company be required to divest itself of the 33% stock interest in Louisville & Nashville now held by ACL. This condition was requested by three intervening roads —Southern, Illinois Central, and Gulf, Mobile & Ohio.

Such a condition, declared Mr. Rice, would compel abandonment of the present merger plan. "I cannot conceive of a Seaboard Coast Line Railroad Company without the retention of the present stock ownership in the L&N. This stock control has existed for nearly 60 years and I can see no reason why this should not continue in the future."

Seaboard President Smith agreed. He noted that L&N stock dividends "have given stability to Coast Line earnings and will do the same for the merged company."

Another condition proposed by Southern—opening of the Jacksonville Gateway "as to all of applicants' traffic moving through Jacksonville"—also drew a firm "no".

The Jacksonville Gateway, said Mr. Smith, "is already open to a remarkable and unusual extent since the existing situation results in the [ACL and SAL] joining in tariffs which, in effect, short-hauls them. The further opening of this gateway would simply mean that through traffic which applicants now handle to Potomac Yard [Washington] or some other gateway for their longest haul would have to be delayed for interchange with the Southern at Jacksonville."

As for proposed conditions requiring the transfer of segments of ACL-SAL trackage in South Carolina, Georgia and Florida to Southern, Mr. Smith protested that the result would be "unjustified invasion of territory" and would "recreate the very kind of expensive and unnecessary duplication of rail operations which the merger seeks to eliminate."

the WP to dry up the property and leave the field to the Southern Pacific."

A parade of supporting witnesses followed Mr. Marsh, to present in detail Santa Fe's arguments on transport competition, on economies which could result from ATSF-WP coordinations (Santa Fe isn't overlooking this aspect either), and on the reasonableness of Santa Fe's stock exchange offer (1¼ shares for each one of WP, compared to SP's 1-for-1 offer).

Highlights of the testimony:

- Leo C. Hudson, Santa Fe freight traffic manager, contended that "in my opinion, if Southern Pacific is authorized to control Western Pacific, there would be to the detriment of the public an expansion of . . . Southern Pacific program of eliminating its railroad competitors from participation in the going rate." In 1959, he said, SP filed "23 notices of independent action announcing their intention to depart from established routes and restrict new rates to their own exclusive or favored routes. The evidence is that this is a current and a long standing policy of Southern Pacific."
- Biggest motor carrier operation in the Pacific Coast region, as ATSF interprets the figures, is Pacific Motor Trucking—a wholly-owned subsidiary of SP. PMT, Santa Fe's Mr. Hudson said, ranked third in revenues among motor carriers operating in the Pacific region in 1959—but the top two (Consolidated Freightways and P.I.E.) are "predominantly transcontinental carriers engaged in the east-west trade."
- Dr. C. C. Herrmann, vice president of Arthur D. Little, Inc., industrial research and consulting firm, said a 1956-59 study of California rail traffic shows that Southern Pacific "dominates to a high degree the rail traffic of the most important state in the West." SP and subsidiaries, he said, "already handle approximately two-thirds of the rail carloads originated and terminated within California. If Southern Pacific were to acquire control of the Western Pacific, its share of the market would increase to almost three-fourths of the traffic. . . . On the other hand, if Santa Fe were to acquire control of WP, it would place only 27% of California rail traffic under the control of a second large carrier in competition with the SP now handling two-thirds of the traffic."
- Motor carriers in the West, Dr. Herrmann declared, "have assumed an important role in the movement of higher-valued commodities over short and medium hauls. . . .(They have) made few important inroads into the intercity movement of high-density, low-value products, which are especially significant in a region having the rich natural resource base of the West."
- Dr. James C. Nelson, professor of Economics at Washington State University, called it "inadvisable to create

(*Continued on page 39*)

WATCHING WASHINGTON WITH WALTER TAFT

Mr. Taft is on vacation. During his absence, this column is being written by other members of the staff.

- **FIRST PHASE** of the five rail operating unions' case before the Presidential Railroad Commission was closed July 31 by H. E. Gilbert, president of the Brotherhood of Locomotive Firemen and Enginemen. Mr. Gilbert wound up the testimony of the firemen by citing a record of railroad accident prevention by locomotive helpers (firemen). He submitted reports on 439 cases where firemen were able to prevent or minimize railroad accidents.

SHARP ISSUE was taken by Mr. Gilbert with testimony from management witnesses which showed working conditions of European rail workers paralleled the changes being sought by U. S. rail management. Refuting management witnesses who testified on one-man locomotive operation in other countries, he said he found in Europe that, "with rare exception, a man performing the work of a helper (fireman) is present on most locomotives."

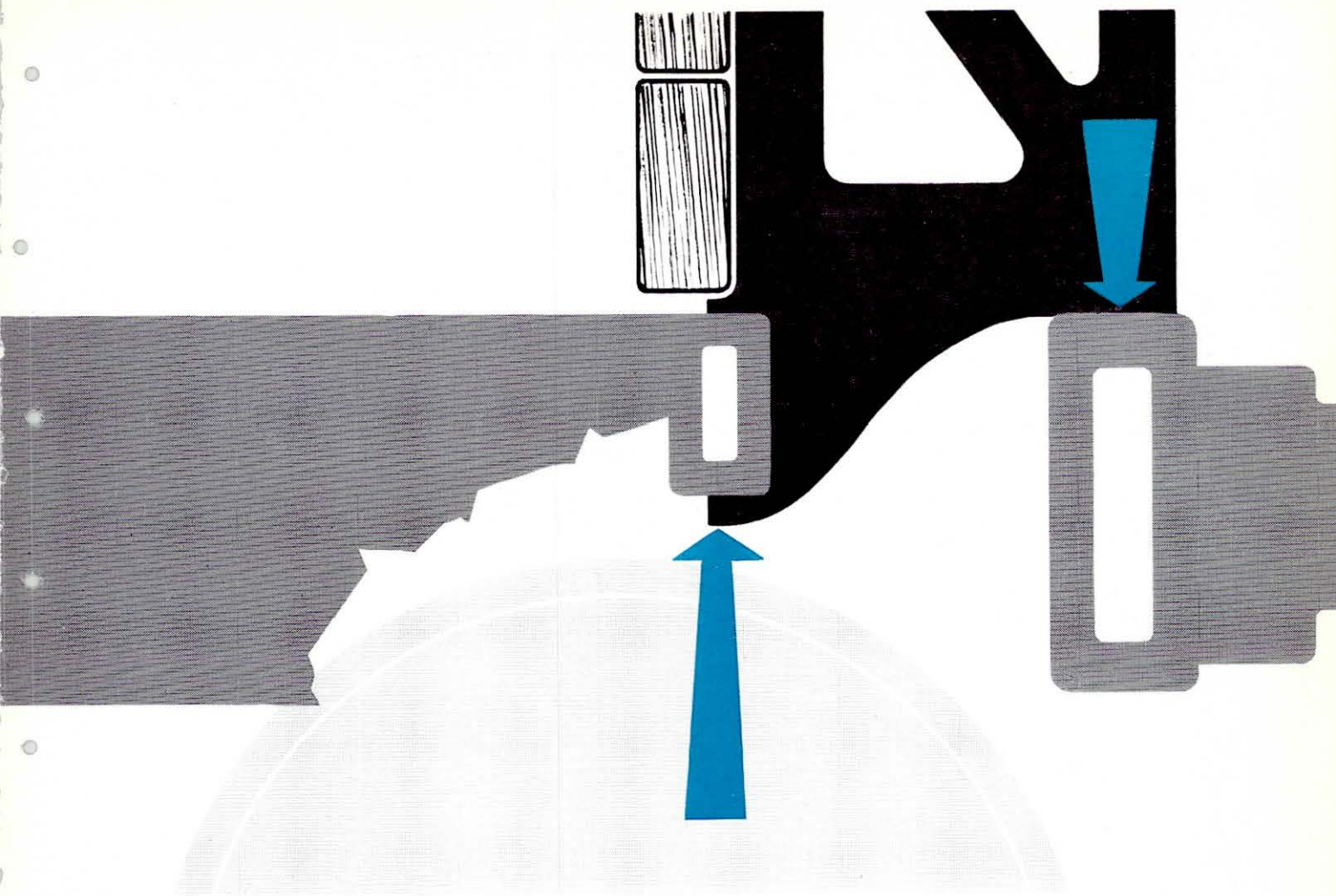
NEITHER did Mr. Gilbert see a precedent in Canada because, he said, more than 95% of Canadian railway locomotives are operated with an engineer and helper (fireman) in the cab. "One-man operation in Canada is negligible," he emphasized.

A NEW PHASE in the ops' case was opened Aug. 1. Harry E. Wilmarth, counsel for the five unions, summed up testimony to be presented by witnesses in opposition to carrier crew consist proposals as related to road and yard brakemen and switchmen or helpers.

REGULARITY OF EMPLOYMENT was cited by Mr. Wilmarth as an issue of "immediate interest to the employee but of substantially less interest to the management [than safety]." Mr. Wilmarth charged that the carriers' proposal that "management shall have the unrestricted right, under any and all circumstances, to determine when and if trainmen . . . shall be used in each crew employed in . . . road (or yard) service . . ." spells irregularity and uncertainty to the employee.

FURTHER TESTIMONY was given through Wednesday supporting present crew consist rules by V. W. Satterwhite, vice president of the Brotherhood of Railroad Trainmen; F. C. Montgomery, alternate vice president of the BRT; and T. M. Walters, vice president of the Order of Railway Conductors and Brakemen. The crew consist issue was expected to run at least through the remainder of the week.

- **HEARINGS ON S. 1197**—the "Hoffa Bill"—are tentatively scheduled to be resumed by the Senate Commerce Committee Aug. 8. The hearings, which have been in recess since July 25, are expected to begin again with testimony by C&NW and Atlanta Freight Bureau spokesmen. Also scheduled to be heard from in the following few days are the Department of Commerce and the ICC. There is a chance resumption of hearings could be delayed a day due to an executive meeting of the full committee.



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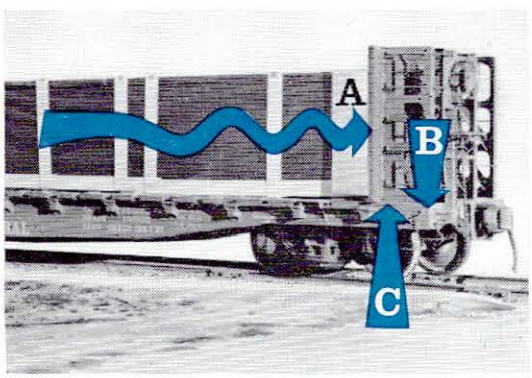

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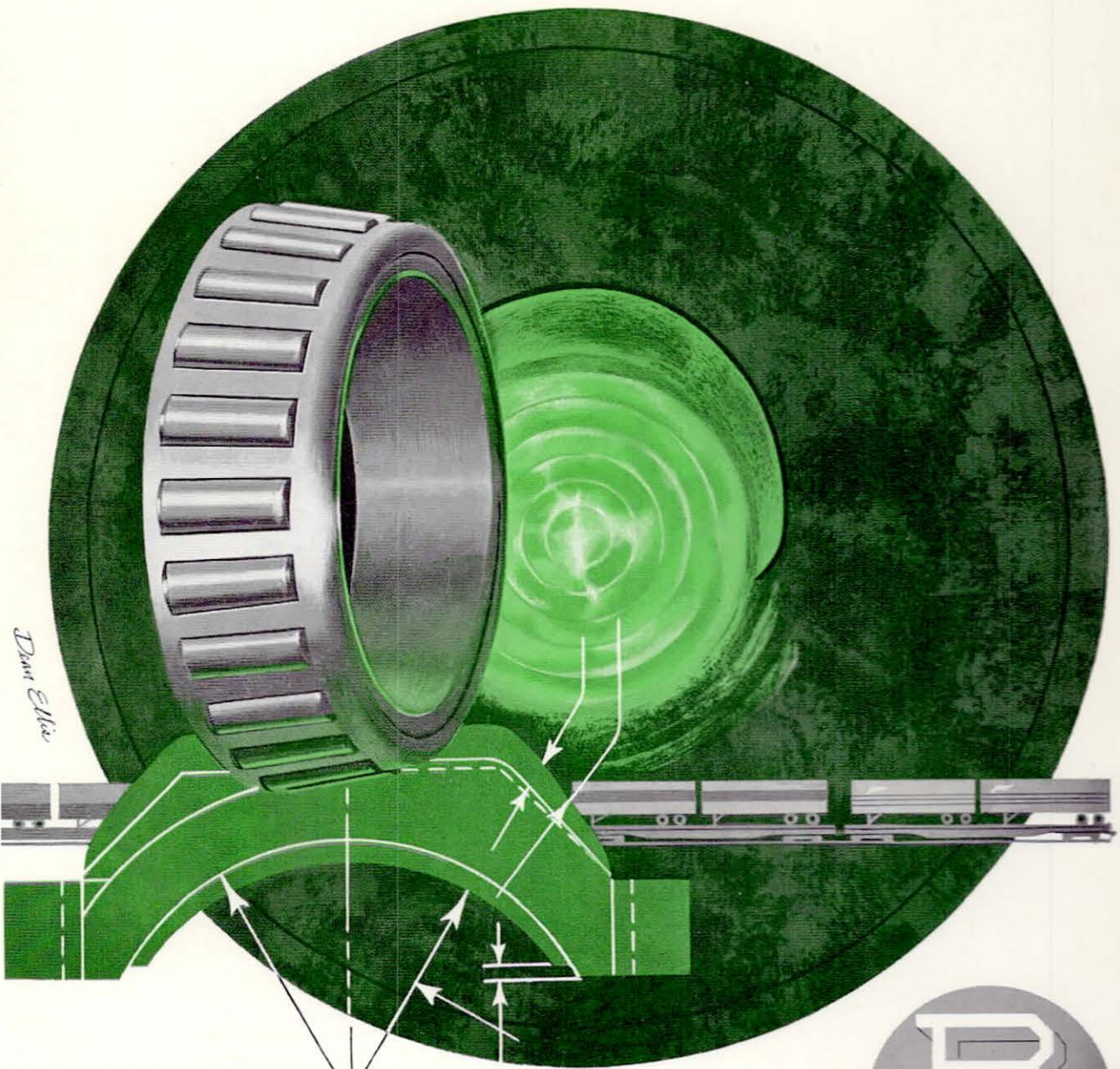

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BEARINGS

L&N Uses Throw-Away Filters

► The Story at a Glance: Air filtration costs for Louisville & Nashville diesel locomotives are being cut in half by use of throw-away air filters. The road's mechanical department estimates a 50% saving when it replaces the original standard permanent panel-type air filters with glass-fiber pads.

More than 300 of the L&N's diesel units have throw-away filters. They are used for carbody and engine-air intake filtration on 100 road units and for engine-intake filters on 211 switchers.

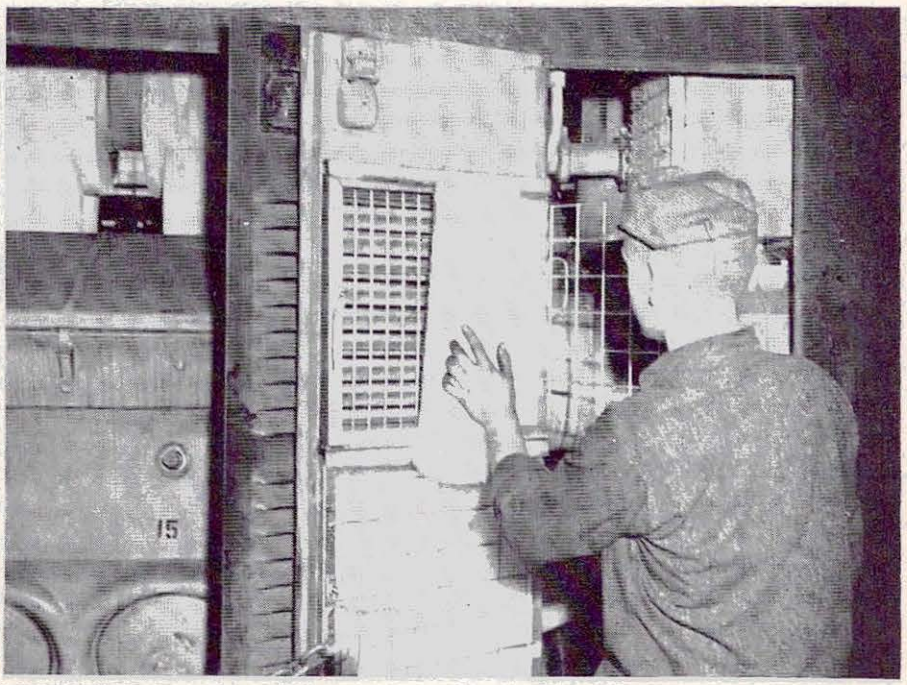
Air supplied to locomotive diesels must be thoroughly filtered so airborne abrasives cannot enter the engine, where they cause rapid wear. All diesel engines have some type of filtration on air intakes. Now most road locomotives also have filters over all air intakes to the engineroom so all air which enters the carbody is filtered. This keeps auxiliary and control equipment clean and means that air which enters the engine is filtered twice—once as it enters the engineroom and a second time as it passes through the intake filters.

About 10 years ago the L&N undertook experiments with the disposable filters sold for domestic furnaces. Its first application was to the air intakes of an EMD switcher. In 1954 several more installations were made; by 1956 the results had proved so promising that the L&N undertook the replacement of all filters on a road unit.

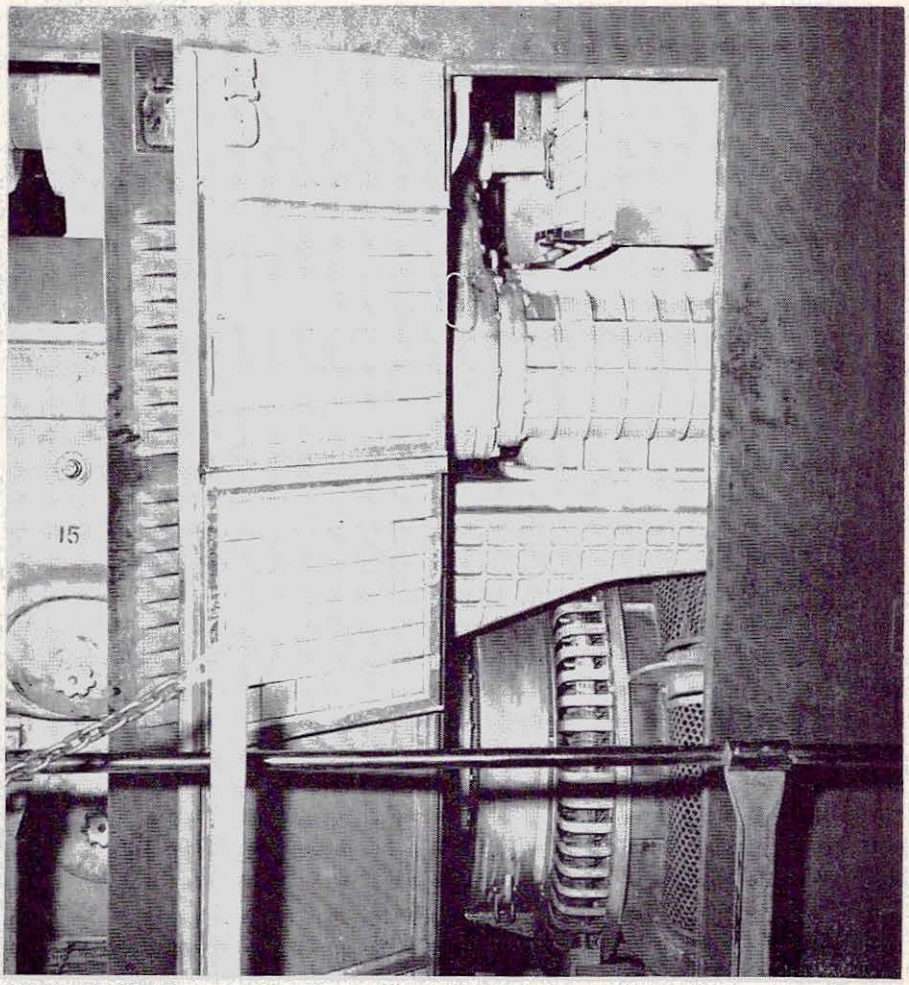
By this time the road's development program had involved American Air Filter Co., which then developed the AmerKleen filters specifically for locomotive and passenger-car service. The filter is a viscous-impingement pad made of continuous glass fibers bonded together.

Following satisfactory completion of its tests, the L&N undertook to apply these filters to all its switchers. Switchers were put ahead of road locomotives because it had been calculated that disposable filter installations on them would produce the most rapid return.

Reduction in servicing costs has been a major factor in this decision. Already, filter cleaning facilities have been eliminated at 17 terminals out of which switchers operate. Filters can be changed where it is most convenient. Frequently this is done at fueling stations. One man can easily carry all the pads necessary for a complete filter change, even on a road unit. This means it is unnecessary to move a heavy load of metal filters to the locomotive or to take the locomotive into a shop for a filter change.



SERVICING costs have been cut for railroad; filter changes can now be made at fueling station because unit does not need to come into shop.



REPLACEMENT of permanent filters presents no problem. Glass fiber pads fit in original frames on hood doors and over engine blowers.

AN EDITORIAL

WILL WEAKENED RAILROADS CRIPPLE THE DEFENSE EFFORT?

erica may be highballing into a defense crisis t whee's. There is certainly one aspect of the reparedness program that urgently needs bringing blic attention.

s publication harbors grave doubt as to whether tant segments of the railroad industry, in their t condition, can cope with anything beyond a t defense effort. To suggest this is not to slur d managements, or railroad employees. The con- s which give rise to concern have largely been d elsewhere—a large number of them in Wash- , to be honest about it.

ice before in the past twenty years the rail car- have proved that they are the bedrock transport n to which the nation turns in time of peril. Yet peacetime this same transport system has been ed to wither and decline. The consequences of this are not pleasant to consider.

ere is an old saying, dating from World War II, ton of steel in Pittsburgh is of no value unless be moved to a factory to turn it into weapons; hose weapons will win no battles unless they can oved to where they are needed. There is sobering in that remark. It is all the more so in the light ent events.

nfronted with the dire prospect of a showdown Russia over Berlin, the Administration has moved p up the defense effort, increase expenditures nlarge the armed forces. As of last week, Con- was moving with uncommon speed to approve w spending and other changes required.

No one questions the desirability of this action, nor is there anything but hope that this enlarged effort will avert a shooting war.

But if one views this new development in perspective, a nagging doubt arises. It is not difficult to spot what appears to be a weak link in the chain—one which AAR President Daniel P. Loomis recognized and put his finger on last week. In a special letter to Vice-President Lyndon Johnson and Speaker of the House Sam Rayburn, Mr. Loomis felt obliged to report that "a crisis of monumental proportions involving major segments of the railroad industry is at hand." Only the week before an important Class I railroad in the East had slid off the brink into bankruptcy.

Consider, then, the implications: on the one hand, the Berlin crisis compels a stronger defense, a defense which could rest heavily on strong railroads; on the other hand, a railroad industry that in 1961 is weaker financially, less well equipped in some respects, even with less ready capacity than it had in 1941, after 12 years of depressed business, low traffic and poor earnings. The comparison makes an ominous picture.

True, not all railroads are in equally poor condition, not all suffer to the same degree from fiscal malnutrition and not all can lay claim to real difficulty. Roads in the South and West are, by and large, in substantially better condition than those in the East. But the reliance of one road on another for the faithful performance of interchange is the critical factor. Weakness in any one segment of the national network is justification for concern for the whole network. This, in essence, was the point of Mr. Loomis' letter.

In the first five months of 1961, a total of 38 out of 107 Class I railroads failed to earn enough to cover fixed charges. Nine in the South and eight in the West also operated in the red.

These figures are merely a symptom, one symptom, of the far-reaching illness that affects the railroad industry. It is an illness the national welfare cannot afford at this critical juncture. Hand-in-glove with beefed-up defense, the Congress would be well advised to concern itself with the railroads.

THE RECORD OF WORLD WAR II

The record of World War II provides ample evidence of railroading's critical role—of the railroads' inherent ability, given half a chance, to perform transport miracles. And make no mistake about it, a miracle is what would be required if events move much beyond their present stage. There just isn't enough manpower, enough oil, and enough vehicles to handle an emergency transport job without the railroads taking on the major part of the job.

More than 97% of all troops, more than 90% of all army equipment and supplies, and about 90% of all navy equipment and supplies were handled by rail during 1941-45. This was, of course, an all-out war effort, complete with manpower and fuel shortages. But even during the Korean war of the early 1950's —where competing forms of transport were unhampered by fuel shortages and scarce materials—the railroads were called upon to transport 72% of all military freight and 64% of the military passenger volume.

Figures are readily available to show that the railroads not only did these jobs, but did them with remarkable efficiency. A train will produce almost six times the ton-miles per employee that a truck will; in terms of fuel consumption, trains will outperform trucks almost four-to-one. Railroads are the best way to conserve scarce manpower and fuel.

There are some who argue that, should another war occur, it will be "different." Indeed it may, with the availability of atomic weapons and missiles. But such thinking misses the point. What the United States is presently confronted with is precisely the same kind of defense buildup that occurred in 1939-40. Whatever follows, there is going to be an urgent need for mass transportation in the interim. As one railroad man observed the other day, "Perhaps it is timely for someone to suggest that our military and security advisors determine whether the various forms of transportation, particularly the railroads, are strong enough to support such an activity."

CONTRAST: YESTERDAY AND TODAY

Just how well are today's railroads prepared to handle the critical defense job? A few figures give rise to wonder. In 1941 the railroad roster of passenger-carrying cars totaled close to 30,000. Today, the total is approximately 17,000. Moreover, many of the present cars, mostly leg-rest coaches and closed-space sleepers, have less capacity per car than the old units had. The small reservoir of mothballed sleepers held by the military could hardly make up the difference.

The freight car story is not essentially different. Many of today's cars are larger than 1941 models were, and the size of the total fleet is not greatly different.

But freight car purchases have been sharply lower for some time—the backlog of new cars on order and undelivered as of July 1, 1961, for example, was less than 12,000. This, even though more than 20% of the present car fleet is 30 years of age and over. If worse comes to worst, railroads could do a remarkable job of keeping this kind of old equipment in service. But such make-do work is a handicap, at best. The plain fact is, about 50% of the present car fleet could stand replacement—just as would occur if railroads had the money to undertake the job.

Meanwhile, it is worth pointing out that total freight capacity of the railroads in 1961, even with heavier loading of cars, is not much greater than the traffic they actually handled in 1956. More new freight cars are badly needed, but no magic wand will produce them. If railroads are to match past performances, builder plants ought already to be operating full tilt.

But a highly questionable passenger car supply, and a potentially dangerous freight car situation, are not the whole story either. The railroad industry has operated for so long at the margins of financial stringency that it has had to keep a consistently tight rein on spending for capital improvements and maintenance of all kinds. The railroad share of intercity freight business dropped from 67% in 1946 to 44% in 1960. Under the circumstances it is surprising the loss wasn't greater.

In the light of these conditions the nature of the problem with which Congress should concern itself is self-evident. Fortunately, the legislators need not take the time to make new studies of the railroad "problem." There has been enough of that already. The record has been updated with hearings and studies ad infinitum since 1950. For the most part these volumes of information have gathered dust. Meanwhile, Jim Crow regulations yoked together with the vast promotional efforts by government in behalf of other forms of transport, have gone on and on. Government spending for highways, airports, airways and inland waterways has now reached the neighborhood of $162 billion —more than five times the private investment in railroads. There is no equity in this situation; indeed, it doesn't even make sense.

WHAT MUST BE DONE

What Congress ought to do, and do quickly, is to go to work removing the regulatory and other burdens which have worked to retard railroad progress. It should do so at once, in 1961, to give the carriers the lead time they need to put their house in order. New equipment and new facilities can't be built and installed in a day.

The railroads themselves have already suggested a blueprint for legislative action. The "Magna Carta," as this blueprint is called, asks that railroads be granted Four Freedoms—freedom from discriminatory regulation, freedom from discriminatory taxation, freedom from subsidized competition and freedom to provide a diversified transportation service. And in asking for these things the railroads said:

"A major cause of depressed railroad conditions lies in unequal government treatment compared with other forms of transportation. As a result, thousands of jobs in the railroad and related industries have been lost and more thousands are in jeopardy, the public has been denied the kind of fast, low-cost transportation a dynamic economy demands, and the nation's defense capability has been weakened to an alarming degree.

"The national interest cries for an end to such distressful conditions. These are matters of legislative determination and can be corrected only by legislative action . . ."

It is the continuing lack of Congressional action, on this and on earlier programs, which has helped drive railroads downhill. The deteriorating railroad situation, which caught the public ear in 1958, has, as one wag put it recently, "continued to deteriorate."

Small wonder there is a concern about the industry's ability to handle a sudden upturn in defense traffic if such should be demanded. It is apparent that no one in government has paid much heed to the advice given four years ago by General James A. Van Fleet, the wartime commander in Korea. He said, among other things, that strong, progressive railroads are a vital need, and that maintenance of a rail plant in readiness for defense requires that it be used in peacetime.

The railroads have spared no effort in trying to bring this about. Success has not been spectacular. Now, unless the new defense program is to run the risk of faltering, everyone had best start working to make up for lost time.

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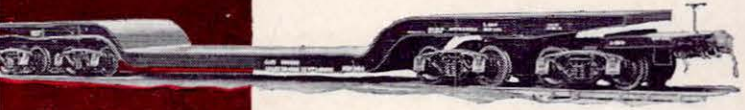
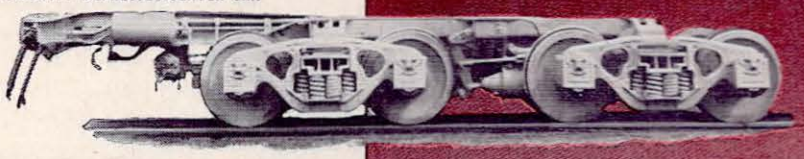
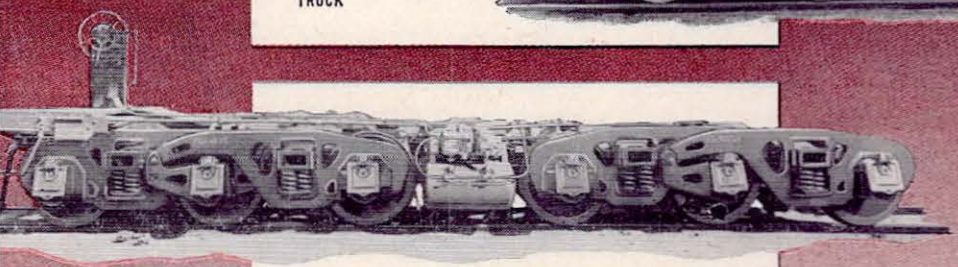


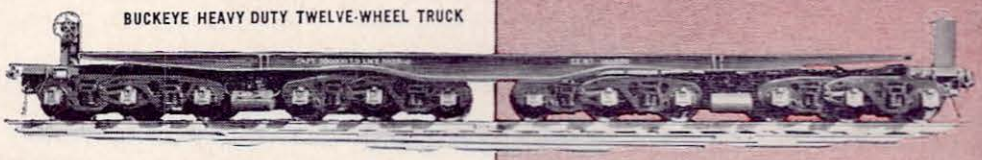
BUCKEYE EIGHT-WHEEL TRUCK INSTALLATION ON 175-TON CAPACITY DEPRESSED-CENTER CAR

BUCKEYE HEAVY DUTY EIGHT-WHEEL TRUCK





BUCKEYE HEAVY DUTY TWELVE-WHEEL TRUCK



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P R I MEMBER

NEW AAR RAIL TEST CAR, fitted with rubber tires, can travel by road between rail testing jobs. It uses the residual magnetic system, with electromagnets for energizing the rails located just behind the front tires, and pickup units for detecting flaws on carriages behind the rear guide wheels.

AAR Rail Test Car Can Use Either Tracks or Highways

► **The Story at a Glance: A type of rail-testing vehicle that can move over highways between on-track testing jobs has been developed in the Detector Car laboratory of the Association of American Railroads. The on track-off track unit was obtained by mounting test equipment in a rubber-tired truck equipped with flanged wheels. By using transistorized components it was possible to fit the equipment into about one-tenth the space occupied by equipment used in the association's on-track cars.**

The AAR has come up with a two-man rail test car that can take to the highways when not engaged in actual testing work. The new vehicles continue the work of the AAR's Detector Car Service in making available to railroads equipment for testing rails to locate internal defects, heretofore performed by two-unit on-track cars operated by three-man crews.

The new unit, known as the Road-Rail test car, was developed in the Detector Car laboratory of the AAR's research center by H. W. Keevil, detector car engineer, and William Brazitis, development engineer. They reasoned that, by miniaturizing test equipment through use of transistorized components, it could be made to fit into about one-tenth the space occupied by equipment in the on-rail units, thus making it possible to use a rubber-tired truck as the carrying vehicle.

By equipping the truck with flanged wheels it could move over a highway to the section of track to be tested, be placed on the track for the test run and then return to the highway for movement to the next section of track. This mobility reduces time spent moving between test locations and also gives more on-track testing time, since the truck clears trains at any convenient road crossing rather than having to travel to the nearest siding. The mobility of the Road-Rail cars also permits faster and more direct movement between railroads. Space is saved, too, in a highway vehicle by eliminating sleeping quarters, because the crew can drive to a motel or hotel for the night.

Three Cars Completed

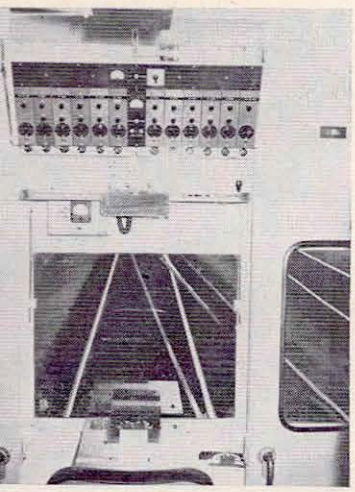
Commenting on the new detection equipment, G. M. Magee, director of engineering research for the AAR, stated that "developments to date with our new Road-Rail test car are most encouraging from the standpoint of performance testing. We have every reason to believe this unit will do as good a job, perhaps even better, of detecting rail defects as our rail-type cars."

Mr. Magee pointed out that the relatively low cost of the new car—about $30,000—is much less than the price of the association's rail-type cars. "I anticipate," he said, "that roads that would like to own and operate their own test units may find it desirable to do so since a unit can be obtained at this relatively low investment."

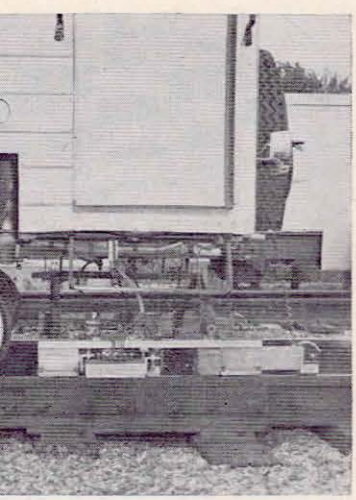
To date the AAR has completed three of the new units and three additional cars are nearing completion. The first car was completed for the Great Northern a year ago. The second, to be retained by the AAR for leasing to railroads, became available for testing and demonstration purposes on April 25 and went into regular leasing service on June 14. The third car was completed for the Santa Fe and placed in service in May. Both the GN and Santa Fe also have contracted for one of the Road-Rail cars nearing completion and the remaining car will be retained by the AAR. Five more cars are planned.

The AAR research center does not sell these cars to railroads, but when a railroad desires one it arranges to obtain and deliver a suitable truck chassis and body to the research center, where the electronic equipment is installed on a

ATOR'S COMPARTMENT is at rear of body where operator obstructed view of track being Body is lined and insulated for of crew.



RDING TABLE has 12 pens, six h rail, which transfer amplified from pickup coils onto 4-in. tape. Transistorized amplifiers ated above recording table.



P CARRIAGE slides along top on Stellite runners; along gage stainless steel runners. Car- ncludes a special pickup device ecting vertical split heads.

cost basis. The railroad is then licensed under AAR patents to use the detection equipment.

The Road-Rail car consists of a specially built aluminum body on a Ford truck chassis powered by a 152-hp V-8 engine. The car is 22 ft long, 7 ft wide, 10 ft high and weighs less than 15,000 lb. It is equipped with 14-in. cast steel guide wheels, power steering, power brakes, front-wheel drive and a standard four-speed transmission. The transmission has been augmented by a reverse gear box for providing high-speed operation in reverse. The car will operate on rails at speeds up to 45 mph, although when testing it usually maintains a speed of 5 to 10 mph. On a highway the truck can be operated as fast as speed limits permit. Other equipment includes a Sparton "Superblast" horn, a rotating amber beacon on top of the body, which is operated when the car is on the track, and rail brushes for activating block signals.

Each guide wheel supports 1,000 lb when the vehicle is on track. The remaining weight is distributed to the four rubber tires, which also operate on the rails.

Both men in the car's crew are qualified operators and take turns driving the vehicle and operating the test equipment. The operator's station is located in the center of the rear wall and includes a recording table, switches and a panel containing 12 amplifiers. The wall contains three windows which give the operator good visibility of the track being tested. Two 22-in. swinging doors are provided adjacent to the operator's position and two 24-in. sliding doors are provided for the driver. A buzzer system permits communication between driver and operator.

For the comfort of the crew, walls and ceiling inside the body are lined and insulated. The floor is marine plywood which has been given a fiberglass-reinforced surfacing coating. Heat is provided by two hot-water heating units. The body also contains locker space, a work bench and electric lights.

The new car utilizes the same residual magnetic system for testing rails that is used in the association's rail-type detector cars. In this system electromagnets set up a magnetic force in the rails as the car moves along the track. In a rail without flaws this force dissipates as the car continues along the track. However, in a rail containing flaws the force in the rail dissipates but leaves a residual force in the defect. The residual force is cut by an induction coil mounted on a pick-up device, which generates a signal. The signal is amplified and transmitted to the recording device on the operator's table. The recording device consists of 12 pens, six for each rail, and a 4-in. paper tape.

The system is designed to test the head area of rails for the entire length of the rail with the exception of 3 in. at each end. Defects readily detected by the car include transverse and compound fissures, detail and engine-burn fractures, and vertical and horizontal split heads. In addition, the car frequently will detect fillet cracks and bolthole cracks that extend into the head area.

On the new Road-Rail test cars there are two electro-magnets, one for each rail, located just behind the front tires under the chassis. Each magnet is supported by a carriage which operates on the rails on two non-magnetic stainless-steel rollers.

How Pickup Units Work

Carriages supporting the pick-up units are located behind the rear guide wheels. Each carriage slides along the top surface of the rail on Stellite runners and along the gage side of the rail by stainless steel runners. Both top and gage runners are kept in contact with the rail by means of springs. The main pickups are located at the front of the carriage. They rock from side to side to follow the contour of the rail. Another pickup, located on the gage side of the head, works in conjunction with one of the main pickups to screen out minor burns and surface blemishes.

An additional pickup device detects vertical split heads. It includes a U-shaped magnet which is positioned transversely of the rail. The purpose of this magnet is to rotate the residual field to enable the defect to be picked up by the VSH detector.

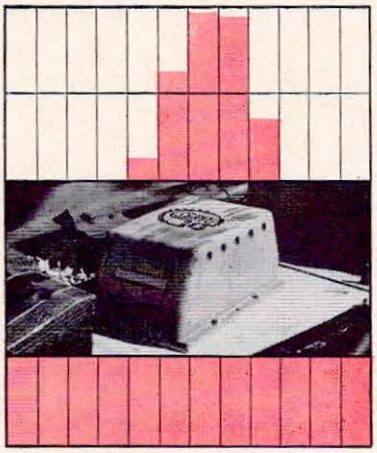
Both the magnet and pickup carriages, as well as the guide wheels, are raised and lowered hydraulically. In the raised position a minimum clearance of 12 in. is provided.

It is interesting to note the result of the miniaturization of the test apparatus. For example, the on-rail detector cars have four large and one small electro-magnets for energizing the rails and two large cabinets of amplifiers. On the new car, there are only two magnets and a small panel of transistorized amplifiers.

The new Road-Rail car, like the on-rail cars, also has equipment for hand-testing rails where the operator cannot see external evidence of a flaw detected by the car. The procedure used in hand-checking rails is the same as that used by the rail-type cars. The Road-Rail car, however, puts only 250 amps of electrical current into the rail, whereas the rail-type cars use 1,000 amps. This reduction in current required the AAR to use a special amplified meter to detect the voltage drop at a flaw.

PHOTO COURTESY OF HOWARD S. PATRICK, ROCKFORD, ILLINOIS

How to scale the summer peak



SERVOSAFE® HOT BOX DETECTIVE*

Everybody talks about the weather . . . but nobody does anything about exploding the age-old myth that the hot box problem is primarily a summer phenomenon.

True, statistics show that the greatest number of car setouts are made during the hot summer months — nearly five times the average winter level. But isn't it logical to assume that lower temperatures probably account for the fewer setouts . . . while many potential hot boxes go *undiscovered* in winter eventually to produce the summer peak?

Figure it out. Prompt detection of winter abnormalities could not only scale down the traditional summer peak, but also save thousands of dollars a year now lost through undetected damage to journal assemblies during the course of the cold season.

Statistics show that a normal bearing, under equilibrium conditions, will run 30°F. above and below the mean operating temperature for all journals on a train. Therefore, a bearing whose running temperature is markedly above this range must be considered abnormal. It should be defined as a "hot box" *regardless of temperature* . . . and long before it reaches the dangerous burn-off stage.

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Why be a slave to tradition . . . a phony one at that? SERVOSAFE Detectives on the right-of-way will not only help scale this summer's peak, but they will also give you a running head start on leveling next year's summit.

*Protected under one or more of the following U.S. Patent Nos.: 2,880,309, 2,947,857 and 2,963,575. Other U.S. and foreign patents pending.

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hy Not Visible Impact Tapes?

department, in a recent issue ly 17, p. 12) raised the ques- Vhy Not Provide Visible Impact Our correspondent, a traveling , pointed out that, with modern stock, it is difficult to fix re- lity for damage. Modern de- said, has been successful in out equipment that is, itself, resistant to damage—generally ably more so than the shipment he car.

is no easy way to tell if a ship- as been damaged, our corre- t wrote, until the car is opened, h time it is probably too late to onsibility where it belongs.

not, Mr. Ux suggested, attach s some kind of simple and cheap hat will help to establish respon- by providing a visual record of pact shocks when they occur? not, indeed, a railroad supplier s week, adding that his company eloped and demonstrated a pro- f just such a device.

•

Question and Answer Editor:

Ux's letter in Current Railroad ns (RA, July 17, p. 12) ap- at a most opportune time. He that impact recorders be made ent equipment on freight cars. editorial summary posed the , "Why not attach to all cars nd of simple and cheap device l give a visual record of high shocks at the time they occur?" t GRS are in hearty agreement that there is a real need for just such a device. Indeed, we have actually developed and demonstrated a prototype model. It was shown to the Committee of Direction of the AAR Communication and Signal Section when they visited us in Rochester this May. We call it the "Responsibility Fixer," and we are already actively engaged in discussions and in practical tests with operating men to determine its final form.

At present, our prototype (or rather "prototypes," as we have a number of duplicates) is pocket size, made of plastic, and should be capable of being quantity produced to sell at low cost. It's easy to reset and can be attached—or removed—from the car in one quick motion, regardless of whether the car is standing still or moving slowly by. The instant the car body—or as Mr. Ux so aptly phrases it, the "big container"—receives an impact, a clearly visible signal is displayed. We've set our prototype to register for any impact of 6 mph or greater, but this choice of setting is still under study.

Right now, the "Responsibility Fixer" is being used in hump yards, to "fix" the points where excessive impacts may occur—before humping, during humping, or after humping. Further tests also will include yard make-up operations. There's a lot more to the "just when did it happen" impact story. The RF's are going to be strategically spotted in road trains, too. They can teach us all a lot about the best methods of train handling, about the effects of train lengths on impacts, about car location in the train, car structural effect, etc. Light, portable, and easily applied or removed, the RF's can be spotted and respotted to bring out the facts we've all been guessing about so long without any real yardstick to check our hunches.

So far, we've discussed the RF as an analytical instrument. It has other uses, too. In an even cheaper, non-resettable form—a disposable item—it can be put on important trains, or used to spot check random trains, with the objective of *rewarding* the crews who demonstrate their abilities at good train handling.

There are many more uses. We haven't hunted them all out yet, but more appear every time we put prototype RF's out on the road.

To close with the salesman's famous opening line, "Sir, I'm glad you brought that up."—*S. W. Freeman, vice president, engineering and research, General Railway Signal Company.*

A forum for railroaders who want to explore questions of importance to their industry, this department welcomes both questions and answers from readers at all levels of responsibility in the industry and associated fields. We'll pay $10 to any reader submitting a question that forms the basis for a column discussion. Address correspondence to Question and Answer Editor, Railway Age, 30 Church St., New York 7, N. Y.

hy Not More Sales Promotion Aids?

appreciated the questions on omotion aids and their impor- the railroads (RA, June 12, p. 10, p. 17).

ailroaders concerned, I'm sure, that service in this day and age nly way out for our railroads. e switch foreman, for instance, rayage company delivering and up freight for the railroads. If good men on key jobs of this ood share of our sales promo- ; been accomplished and will ıe sales representative's job a productive one. We must sell our service and then I am sure we will have productive railroads.

The shipper should have full confidence in the local staff of the railroad serving him. A negative attitude could very well discourage business and divert it to our competitors.

As many of our railroads are discontinuing the handling of less-than-carload freight, mainly on interstate business, we have many stations that cannot be served by the railroads at all. There are also many stations—known to the local railroad concerned to receive very poor service beyond their own line—that can be served by a competitor in an expeditious manner. In a case of this sort, I believe the shipment should be turned down and an explanation made to the shipper, thus establishing a better relationship and adding confidence in our ability to serve him. Our rank and file must gain his confidence before we can prosper and expedite further promotional aids.—*Gaylord E. LaGraves, rate clerk, Soo Line.*

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1. This high-quality stand is priced low.

2. It takes the cost and bother out of switch point adjustment: you simply add or remove a shim or two, and the shims are stored right in the housing.

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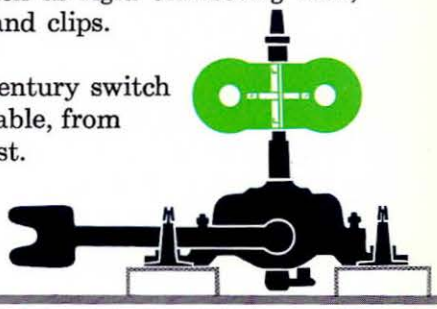

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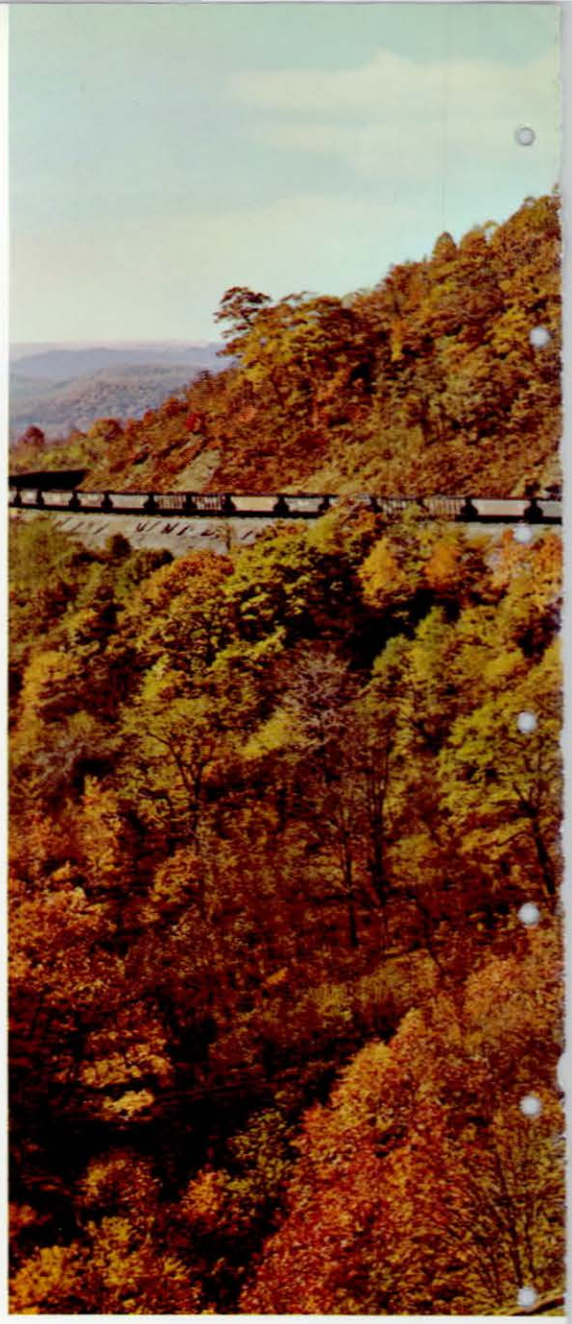
ll gladly send you Booklet 525-A; just use the coupon on t page of this advertisement. Better still, let a Bethlehem engineer show you our detailed information on fully reated rail installations.



This curving grade is typical of a number of locations where an eastern trunk line laid 1,200 tons of Bethlehem heat-treated rails last year. Treated rails were installed on eastbound track only, since tonnage traffic is predominantly eastbound.

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. . . Economy
. . . Versatility

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Bethlehem manufactures one-wear, two-wear, and multiple-wear wrought-steel wheels for all types of railroad service: freight, passenger, and locomotive. More than 2,500,000 Bethlehem one-wear freight-car wheels have rolled over the nation's rails during the past 30 years. When you buy Bethlehem Wrought-Steel Wheels you can be sure of long, dependable service.

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Seattle Eyes Monorail System

► **The Story at a Glance: A monorail rapid transit system which could eventually have 110 miles of track is under serious consideration in Seattle. The first unit—a so-called "backbone line"—would run 25 miles from Montlake Terrace, a suburban community to the north, to Seattle-Tacoma International Airport just south of the city limits.**

Cost of this initial project is estimated at between $60 and $70 million.

Seattle currently is building a short monorail which will carry visitors to the 1962 World Fair from the downtown area in 95 seconds (RA, April 3, p. 23).

If this full-scale monorail proves a success, civic leaders plan to ask the voters to endorse a revenue bond issue for a 25-mile route that could be a first step in an eventual 110-mile system.

Ben B. Ehrlichman, Seattle capitalist and financier who was the first to propose the new system, said preliminary studies indicate the average cost would be $2½ million dollars a mile, including a short stretch in the downtown area where costs would go as high as $5 million a mile.

"This is a grand adventure in finance and engineering," Ehrlichman said, "but we are going about it in a hard-headed business fashion. If our studies show it is a sound venture, we'll ask for an election next year."

Need for the monorail is illustrated every day at the Seattle-Tacoma International Airport. If a Seattle businessman drives travellers from downtown to catch a California-bound jet, the travellers are half-way to Los Angeles before the businessman has returned to his office through peak traffic. Monorail trains would reach the airport in 9 minutes.

Ehrlichman stressed, however, that no decision will be made until the Seattle World Fair line starts operations. Expected to be completed in December, the line will be put into use immediately. By the time the World Fair opens on April 1, it is expected sufficient operating data will be available to justify a decision.

The World Fair line is being built by Alweg Monorail Corp. Two aluminum monorail trains of four cars each will make the run in 95 seconds, powered by electricity.

The World Fair tracks will be 12.8 ft apart and about 30 ft above ground level. The big I-beam monorail will be 3 ft wide and 5 ft deep, with power supplied from two copper rails on one side of indented track. Each end of each car rides on a "bogie," a frame of six wheels equipped with truck-size rubber tires. Two of these run on top of the track and two on each side at right angles to the I-beam, the horizontal wheels providing stability.

The trains themselves now are being manufactured in Germany and will arrive in Seattle in November. Cost of the World Fair line will be $4.2 million. Alweg will turn the system over to Seattle Transit System, municipally-owned line, for operation.

If the Ehrlichman plan becomes a reality, it will be carried out as a publicly-owned utility by the metropolitan district which is a public entity and has the right of eminent domain. It will be able to condemn and acquire privately-owned bus systems as well as lands for right-of-way and for parking at terminals and intermediate points.

An essential part of the plan involves the consolidation of the Seattle Transit System and private feeder bus systems which serve Seattle suburbs, so the entire district's transportation can be integrated and scheduled to mesh with the rapid transit monorail. With voter approval in 1962, the system could be a reality by early 1964, according to Ehrlichman.

'Slow' Switch to Containers Predicted

The transition to containerized shipping is inevitable—but it will take place gradually, occurring "slowly over the next 10 to 20 years."

That's the conclusion of a containerization study prepared for Halle & Stieglitz, a New York investment house, by Boni, Watkins, Jason & Co., economic and management consultants.

The study finds five deterrents to faster development of containerization:

(1) A large capital outlay for equipment subject to very rapid obsolescence is involved.

(2) Large amounts of capital are tied up in old-method equipment.

(3) Lack of standardization precludes the realization of full saving potential.

(4) Certain labor groups are resisting the trend toward containers.

(5) The regulatory status of rates is uncertain. (This study was prepared prior to the recent ICC decision which approved numerous Plan III and Plan IV piggyback rates.)

But the rewards of containerization, when it does break through in a big way, will be great, the study finds. It says containerization promises to:

(1) Reverse the trend away from public carriers and toward private ownership of equipment.

(2) Reverse the trend away from rail transport.

(3) Lower the proportion of transportation cost accounted for by labor.

(4) Revolutionize the competitive relationships among common carriers, producing a situation where cooperation permits maximum economy.

The switch to containers, say the authors of the Halle & Stieglitz study, will be a "major breakthrough" in improving the distribution process.

"Though technological advances have accelerated the pace of traffic movement by all types of transport media—super-speed merchant ships, crack freight trains, motor carriers, jet airliners—the full potential gains from faster speeds has not, as yet, been achieved. This deficiency is traceable to time losses involved in transferring freight from one carrier to another.

"Except for the few remaining local bakeries and similar shops catering to neighborhood trade, products of no business today move by a single transport media directly from producer to consumer. To expedite the transfer from one carrier to another—and thereby save time—is a primary aim of containerization. Its attainment demands that the form, size, and weight of each shipping unit be adapted to the materials-handling and vehicular equipment of the several successive carriers."

The study's authors see a number of reasons why containerization might replace piggyback—it would eliminate multi-state highway licensing; overcome special routing problems created by limited clearances for piggyback trailers; and permit higher train speeds than do trailers-on-flat cars, with their off-balance load characteristics and high center of gravity.

LITY ON THE DOLE—I hear rich old Uncle Sam is spending $38,000,000 of money to add one mile to the navigability of the ssippi in the Minneapolis area. The purpose, I'm is solely to permit barge delivery of coal to a tely-owned electric power plant.

ere must be some mistake here. From all I read in papers about the electric power industry—speeches xecutives and advertising the industry does—they are ead set against anything savoring of socialism.

RETIRING MR. DORIGAN—Harry Dorigan, one of the trustees of New Haven, was retired on pension from that road 950. Soon thereafter he was back railroading again sistant to president of the Jersey Central, which four later named him its traffic vice president. He re- from that assignment last December and moved to da. Now he's back with his old company (where he ed 36 years).

lot of retired people keep themselves interested and pied by consultation and other part-time work, but record of stepping twice out of retirement into ll-time assignment, further up the ladder than the he relinquished, is something of a novelty.

ERFUL CHEMINOTS—Noteworthy for their confidence in the brilliant fu- of railroading are the "cheminots" (railroaders) of ce. Their optimism is reflected alike in their con- tion, and their public statements and writings. Their railways are not profitable—but for reasons of political policy, not for inherent causes. It just so happens that the government wants the public to get railroad transportation at somewhat less than its total cost (i.e., the way the U.S. government treats highway, waterway and air transportation).

So the railroads serve the public at attractive rates, traffic keeps on growing, the government makes good the deficit, and there is plenty of money to spend on improvements.

I've just been reading "The Railway Year 1961" (Année Ferroviaire 1961), which is published each year and records the performance of the French railways in the preceding years—not just the financial and traffic figures, but summaries of progress in methods and technology. The 1961 edition also has quite a discussion of the technology and performance of heavy-duty ore railroads that have been built (or are projected) in various parts of the world, including the Miferma line in Africa. The authors (both of them experienced railway engineers) believe the modern ore train can "successfully compete with the best natural waterways."

A JENKS GIFT CYCLE—C. O. Jenks, retired GN operations vice president, became a GN superintendent around 1905 and at that time presented a little book (published by Railway Age and entitled "Letters from an Old Railway Official," by C. D. Hine), to his father, Cyrus H. Jenks, who was then also a GN superintendent.

After the death of C. H. J., the book went to a nephew, Henry M. Shapleigh (later to become, also, a GN superintendent). In due course Mr. Shapleigh passed the book along to his kinsman, Downing Jenks, now president of the MoPac; who just a few days ago returned the book to his father, C. O. Jenks, the original donor. Thus, after 56 years, the book had made the full circle, Jenks to Grandfather Jenks to Nephew Shapleigh to Grandson Jenks and back to C. O. Jenks, who started the chain.

Along with the gift from Downing Jenks to his father was a photocopy of a letter that Cyrus had written to his son C. O. back in 1904, offering him some counsel on his promotion to superintendent. Among the admonitions was this: "If you've been wearing a 7⅛ hat, do not increase the size."

HINE, EFFECTIVE AUTHOR—That literary effort of the late C. D. Hine has enjoyed a remarkable vitality. There were two books —one "Letters from an Old Railway Official to His Son, a Superintendent," and a second one "Letters to His Son, a General Manager." These books are still read, and recommended as "worthy of any present-day railman's time —especially young operating men."

In the June 1961 issue of "Revista Ferronales" (magazine of the National Railways of Mexico) appears an article with the title: "Carta de un antiguo ferrocarrilero a su hijo," which turns out to be a translation in Spanish of an excerpt from the Hine book.

I knew the late Major Hine myself, slightly, back in the Twenties, when I was a cub railroad editor and he was a mature railroad consultant. I recall him as a lively speaker, but somewhat of a martinet—an impression I gathered, perhaps, from my Dad who, as a fledgling freight conductor, had worked under Hine when he was assistant superintendent on the Alton.

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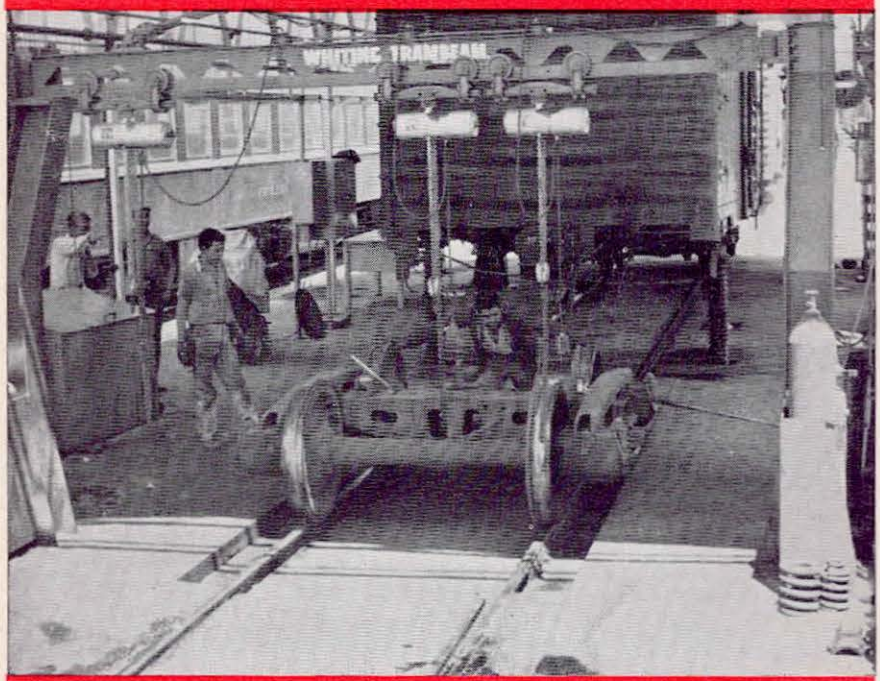

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Letters from Readers

A Suggested Program

Alexandria, Va.

To the Editor:

I have just had the opportunity of reading your May 15 edition and one article, "Passengers at the Crossroads," proved to be quite interesting.

While I realize there are technical problems to be resolved in this matter, I would like to suggest, in the interest of stimulating passenger business, the following program:

Reproduce in widely subscribed magazines, i.e., Saturday Evening Post, Ladies Home Journal, etc., the crack trains shown on pages 18, 19, 22, 23, 26 and 27 with a small amount of additional information about each train. The charge for this advertising could be pro-rated among the participating railroads.

There is no doubt that your magazine is widely read. However, I feel by using the above suggestion information concerning the comforts and qualities found in the use of these trains would be imparted to many more potential passenger-train travelers.

Having been associated with the railroad industry since 1921, at present I am with the Interstate Commerce Commission, Washington, D. C. I believe, as your article states, there is still hope for the railroads to secure and maintain additional business in passenger travel. To do this, one must let the traveling public know the advantages it has to offer.

Paul F. Martineau

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CTC on Santa Fe Line Change

► **The Story at a Glance: Everything that would make operations as swift and efficient as possible has been included in the Santa Fe's new $20-million, 44-mile railroad between Williams Junction and Crookton, Ariz. The double-track line has signaling arranged for reversible running, with crossovers spaced at about 11-mile intervals, automatic inductive train stop to permit high speeds, and set-out tracks efficiently oriented. An interesting feature is the two-mile spacing between the two legs of a double crossover, giving the effect of a passing siding.**

Time savings of about one hour for passenger trains and of two to three hours for freight trains are being made over the Santa Fe's new 44-mile line between Williams Junction and Crookton, Ariz. (RA, Mar. 14, 1960, p. 28) The new route, approximately the same length as the old mainline, permits maximum passenger train speeds of 90 mph throughout, and 60 mph for freights.

The previous line between Crookton and Williams was a double-track line, but with the two tracks often taking quite separate routes. Automatic block signaling was employed. Sharp curves, exceeding 10 deg, made speed restrictions of 15 mph necessary at some locations. Grades up to 1.8% also held down train speed. By comparison, about half the mileage of the new line is on curves, but curvature never exceeds 1 deg. Maximum compensated grades on the line never exceed 1%. Former westbound and the eastbound tracks west of Ash Fork will be torn up. One track east of Ash Fork will be retained as a connection to Phoenix. The old mainline was left-hand east of Crookton, because much of the trackage in this territory was laid originally as single track. When a second track was added later, it was designed to provide more favorable grades, and left-hand traffic was employed to take advantage of the better grades for tonnage trains.

The line change joins the original mainline at a point east of the town of Williams, which is known as Williams Junction, and at Crookton. Initially, signaling for reversible running was installed between these two points. An extension of reversible running, from Seligman on the west to Maine on the east, has just been completed. The traffic control system installed as part of the line change is governed from a 15-ft TCC machine at Winslow, 92 miles east of Williams.

In a change from more recent Santa Fe practice, colorlight rather than searchlight signals were installed. "We decided to use colorlight signals on the Williams Line Change in order to develop standards for modern construction, and afford a comparison with late searchlight installations," says J. A. Parkinson, general superintendent of communications and signals. "Our past experience has indicated that colorlight signals are quite satisfactory in this territory."

Signals on the line change have one or two arms. A three-unit signal head is used in all cases (to simplify stock) even though no red is ever displayed on the lower arm. (In territory where searchlight units are used, the roundel in the bottom unit, where red would normally be, is blanked out. The Santa Fe's philosophy is to keep aspects as simple as possible. Since a single green or a single red aspect has the same meaning as green/red or red/red, respectively, the lower arm, where used, is dark in these cases.)

Within the new line are three sets of crossovers, with a set of crossovers also located at each end of the change. The wide spacing between the individual legs of the pair of crossovers provides the equivalent of a two-mile siding in addition to the reversible running. Two extra signal bridges and four extra signals are required for each pair of crossovers by this method.

In proximity to each pair of crossovers (except at Williams Junction) is a setout track for bad order cars, connected to the mainline at each end by electrically locked switches located outside the signal limits of the crossover. Time release alone is used to release the electric lock on these switches. In three cases, this setout track is located outside the signals between the two crossovers. At "Double A" (named for a nearby ranch), however, the setout track spans the signal limits of one of the crossovers.

The crossover turnouts are No. 24, good for a speed of 50 mph. Consideration is being given to increasing the allowable speed through the crossovers to 60 mph. Helper connections are provided. The switch points on this size turnout are 39 ft long, and there is quite a bit of spring in these long points. A switch controller is connected to the No. 5 rod to insure that the entire point moves instead of just the tip. It is hoped thus to detect obstructions, such as rocks, which may be some distance back of the tip.

For a movement through a crossover, a train first encounters a flashing green aspect, "Approach Limited," at the approach signal. This flashing green aspect is properly safeguarded by checking the flasher relay operation with two slow-release relays. Should the flasher fail, the aspect is changed to a steady yellow "Approach," a medium-speed indication. At the home signal the aspect displayed is red over green, "Diverging Clear," unless track occupancy conditions require a red over flashing yellow, "Diverging Approach" (red over a steady yellow is "Restricting"). The diverging route aspects carry no speed restrictions in themselves; the timeable specifies the maximum allowable speed through the turnout.

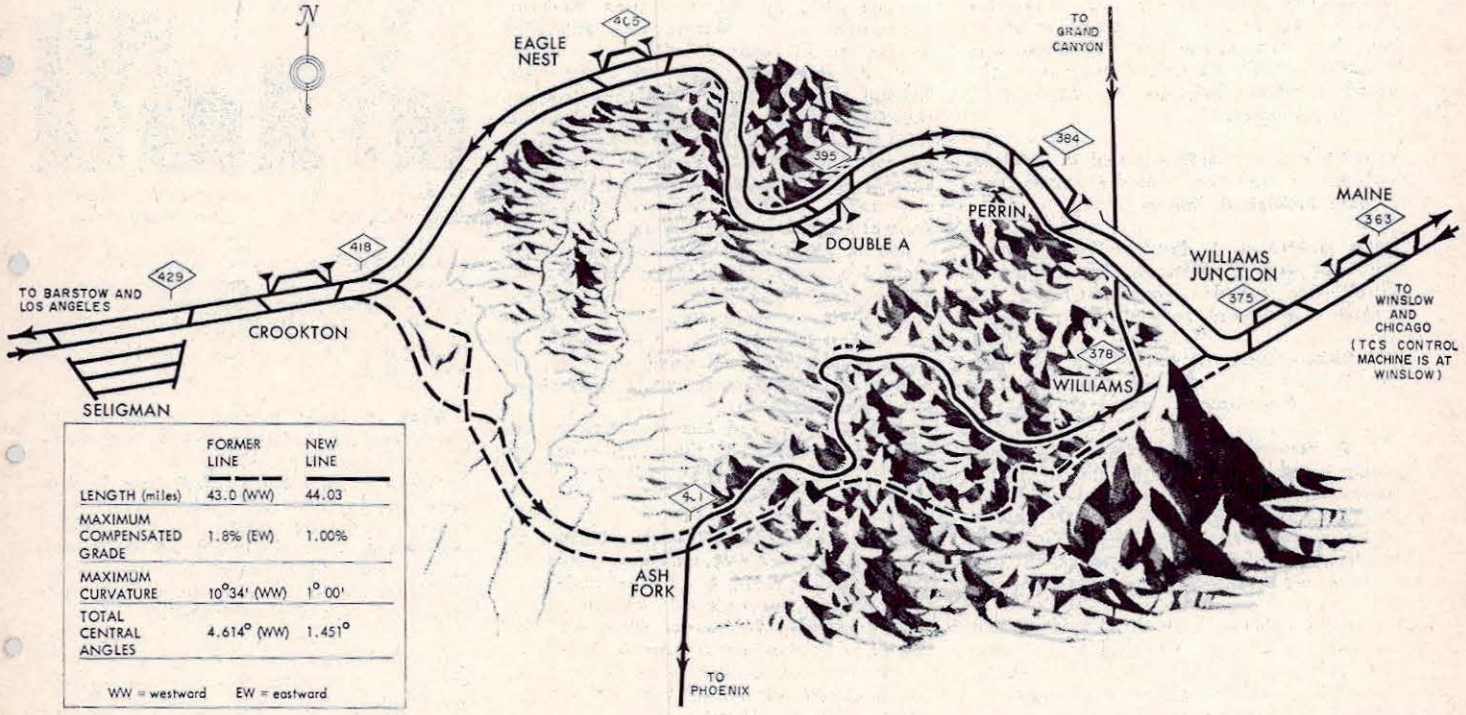
The signal bridges and instrument houses were set in place before the track. This was done for two reasons. First, once the grading had been completed, the track was put in place at a very rapid pace (all welded rail in 1,440-ft lengths), so the signal gangs had to work ahead of the track gangs to have time for a thorough check before the system was ready for service. Second, the 12-ton concrete instrument houses (complete with instruments and wiring) would have had to be lifted from a flat car with a wrecking crane, a costly operation—and then the crane often could not reach out as far as needed. The houses and steel structural members for the bridges were delivered to the sites by flat-bed trucks and hoisted into place with truck cranes.

Signal bridges used by the Santa Fe are relatively simple steel girder affairs. Normally, the two legs at each end of a bridge come straight down, parallel, on 4-ft, 4-in. centers. These are then attached to a single large precast foun-

Extensive Blasting Required

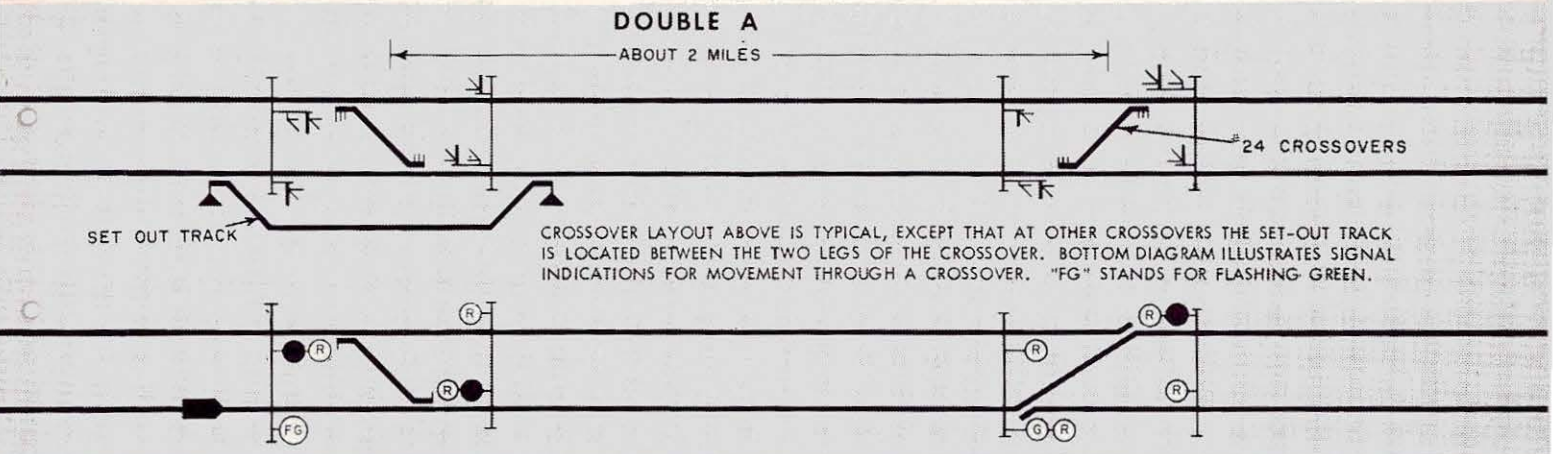
Much of the line change was through flagstone or malpais (lava) which required blasting for roadbed, line poles and even signal foundations. More than 12 million cubic yards of rock were moved in building the new line from Williams to Crookton. Cuts 20 ft or more deep were common. At cuts, the pole line went over the top which required long drops to signals.

Cuts Train Times 1 to 3 Hours



	FORMER LINE	NEW LINE
LENGTH (miles)	43.0 (WW)	44.03
MAXIMUM COMPENSATED GRADE	1.8% (EW)	1.00%
MAXIMUM CURVATURE	10°34' (WW)	1° 00'
TOTAL CENTRAL ANGLES	4.614° (WW)	1.451°

WW = westward EW = eastward


DOUBLE A
ABOUT 2 MILES
24 CROSSOVERS
SET OUT TRACK
CROSSOVER LAYOUT ABOVE IS TYPICAL, EXCEPT THAT AT OTHER CROSSOVERS THE SET-OUT TRACK IS LOCATED BETWEEN THE TWO LEGS OF THE CROSSOVER. BOTTOM DIAGRAM ILLUSTRATES SIGNAL INDICATIONS FOR MOVEMENT THROUGH A CROSSOVER. "FG" STANDS FOR FLASHING GREEN.
R
FG
G

dation. However, due to the hard rock, it was decided that poured foundations were more practicable for this project and the legs of the bridge were spread to wide centers at the base.

Foundations for small cases consist of precast concrete "logs" forming the base of the foundation, topped by a precast cap. These concrete foundation parts were cast at the Santa Fe's San Bernardino shops.

A pole line was constructed along the line change, with 35 Class 5 poles to the mile (light-heavy loading)—their standard for communication pole lines. The holes for 90% of the approximately 1,540 poles had to be blasted out of rock. There are two signal crossarms and one communication crossarm, all 10-pin, throughout the line change, plus a shorter arm for a 4,800-volt transmission line part of the way. The communications crossarm is below the two signal arms where the 4,800-volt lines exist, and above the signal arms in the remaining distance.

From four to six signal gangs worked on the line change; four were used in the earlier phases of construction, and six later on as the completion date neared. The average gang consisted of 15 men.

Signal equipment was supplied, for the most part, by Union Switch & Signal. The instrument cases were wired at the San Bernardino signal shop, and given a circuit breakdown check there. When the cases arrived at their ultimate site, only external connections and final circuit check were required.

Relays performing similar functions in different relay cases are placed in similar locations within the cases. The instruments are identified on the front of the shelf by ¾-in. high, black-on-yellow letters on a cloth tape. The large lettering and similar placing make the instruments easy to locate and identify in case of trouble. The San Bernardino shops also cast concrete battery boxes and foundations used on the line change.

The signal work for the line change was under the immediate supervision of J. L. Bartlett, general signal supervisor for the Coast Lines, with headquarters at Los Angeles. J. M. Rice is signal engineer for the Coast Lines, and Mr. Parkinson is general superintendent of signals and communications, system.

PEOPLE IN THE NEWS

ERIE-LACKAWANNA. — **Perry M. Shoemaker** elected chairman of the board, effective Sept. 1, to succeed **Harry W. Von Willer,** who will retire. Position of vice chairman of the board, presently held by Mr. Shoemaker, will be abolished.

ILLINOIS FREIGHT ASSN.—Harold R. Johnson, assistant to chairman, named chairman, succeeding **Rudolph G. Raasch,** retired.

ROCK ISLAND.—L. B. Pritchett, resident vice president—traffic, Ft. Worth, Tex., appointed acting vice president—traffic, Chicago, to replace **F. J. Conrad,** resigned.

SEABOARD.—Charles T. Abeles, general solicitor, Richmond, Va., and **J. F. Rivers,** assistant freight traffic manager, Savannah, Ga., retired July 31.

T. W. Edwards, Jr., assistant general passenger agent, New York, appointed general passenger agent, Washington, D. C., succeeding the late **Edward Plack. John T. Busbee,** traveling passenger agent, New York, appointed division passenger agent there and is succeeded by **Lawrence E. Roxbury, Jr.**

SOUTHERN.—William T. Shivell, district freight and passenger agent, Miami, Fla., has been appointed assistant general freight agent, St. Louis, Mo., succeeding **Oris A. Vinyard,** retired. **Otis S. Dorian,** district freight agent, Atlanta, Ga., transferred to Jacksonville, Fla., succeeding **Rufus H. Lawrence,** who succeeds Mr. Shivell. **L. Marion Mathews,** commercial agent, Macon, Ga., appointed district freight agent, Atlanta.

W. R. Donaldson, assistant comptroller, Atlanta, Ga., transferred to Washington, D.C. **G. H. Keller,** auditor of freight accounts, Atlanta, succeeds Mr. Donaldson. **J. T. Bolling,** auditor for computer accounting, appointed auditor of freight and passenger accounts. **J. N. Black,** auditor of passenger accounts, succeeds Mr. Bolling.

Jack D. Parr, Jr., assistant general freight agent, Washington, D. C., appointed assistant general freight and passenger agent Spartanburg, S. C., succeeding the late **C. S. Bramlett. George W. Bynum,** office manager to vice-president-traffic, Washington, D. C., appointed assistant general freight agent there, succeeding Mr. Parr.

John Wiley Cox and **Andrew F. Downey, Jr.,** assistant directors of labor relations, ap pointed directors of labor relations, Washington.

TEXAS & NEW ORLEANS.—J. V. Watson, assistant general auditor, Houston, appointed general auditor there. **H. T. Wray,** auditor of disbursements, succeeds Mr. Watson, and in turn is replaced by **Horace Olive,** assistant auditor of disbursements. **M. O. Jones,** assistant to general auditor, replaces Mr. Olive.

T. O. Siegmund named assistant superintendent of shops, Houston, Tex.

Supply Trade

Percy S. Gough has been named to the newly created position of director of marketing, **American Hoist & Derrick Co.** He was formerly general sales manager, Crosby-Laughlin Division.

A. Conant Moulton has been appointed director of public relations of **Fairbanks, Morse & Co.,** Yonkers, N. Y. Mr. Moulton was formerly director, information services, General Dynamics Corp., New York.

Gilbert R. Shockley has been named general director, product development division, by **Reynolds Metals Co.,** Richmond, Va.

Earl W. Ball, railroad sales manager for the Esso Region of **Humble Oil & Refining Co.,** has been appointed coordinator of railroad, inland marine and gas transmission line sales in the new Humble headquarters marketing department, Houston, Tex.

Gordon L. Kibbey, sales engineer, **Transportation Equipment Division, American Steel Foundries,** has been promoted to sales agent.

J. F. Weiffenbach has joined **Trailmobile Inc.** as vice president of engineering, succeeding **J. J. Black,** retired. Mr. Weiffenbach previously was director of research and engineering for Borg-Warner Corp., Chicago.

R. G. Parks, treasurer, **National Castings Co.,** Cleveland, also has been elected a vice president. **Roy Willison** has been named vice president and general manager, Industrial Division.

Charles D. Schmidt has been named manager of the Detroit district sales office, **Whiting Corp.,** Harvey, Ill. Mr. Schmidt was previously on the sales staff of the Chicago office.

Percy S. Gough
Am. Hoist & Derrick

A. Conant Moulton
Fairbanks, Morse

Albert Schiffers, Jr., 332 S. Michigan Ave., Chicago 4, Ill., has been appointed sales representative for the **National Lock Washer Co.** in the states of Illinois, Indiana, Iowa, Michigan and Wisconsin, succeeding the late **E. Harbeck.**

Frank M. Barry, assistant to the district sales manager, **Colorado Fuel & Iron Corp.,** has been appointed district sales manager, Northern California district. **Thomas D. Guy,** sales representative, Northern California district, has been named assistant district sales manager of that district. **N. H. Nordby,** district sales representative, Butte, Mont., has been appointed assistant district sales manager, Boise, Idaho, district.

Jack W. Borger has been appointed assistant to the vice president, engineering, **Pullman-Standard.** Mr. Borger, formerly with the company's Research & Development Department, has been specifically assigned to the passenger and rapid transit fields of engineering.

Don T. McKone, Jr., vice president of **Aeroquip Corp.,** Jackson, Mich., has been appointed executive vice president in charge of domestic manufacturing and sales operations.

Weakley-Watson Company, Brownwood, Tex., has been appointed a distributor of pipe for **A. M. Byers Co.**

P. O. Willaman has been appointed manager, COBRA brake shoe sales, Air Brake Division, **Westinghouse Air Brake Co.,** New York. Mr. Willaman was formerly representative of that division, New York district.

W. W. Gould has been promoted to nickel-iron battery market manager of Exide's Industrial Marketing division, **Electric Storage Battery Co.** Previously, Mr. Gould was Chicago district manager for the Nickel-Alkaline division.

Whitehead & Kales Co., River Rouge, Mich., has become a member of the Railway Progress Institute. **William R. McCormick,** manager of the Railroad Division, will be the company's voting representative.

Leland G. Phillips has been named sales engineer at the Chicago District Office by **Union Switch & Signal** Division of **WABCo.**

Lifschultz Fast Freight moved its New York executive offices to 386 Park Avenue South July 1. The company's New York terminal continues at the previous address.

OBITUARY

Henry J. Carr, recently named assistant vice president—rates, **Missouri-Kansas-Texas,** St. Louis, died July 27.

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Teletype service—Family Plan

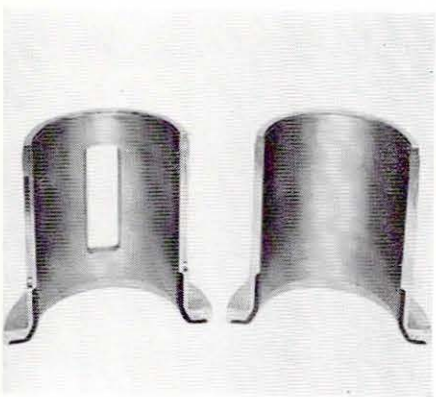
NEW PRODUCTS REPORT

Motor Scooter (RA-1)

A lightweight three-wheeled motor scooter, suitable for messenger service and light hauling in railroad stations, shops, terminals and warehouses, will travel up to 16 mph and do better than 50 miles per gallon of gasoline. Accessory equipment includes a large basket attachable to the steering column, rear sulky seat, trailer for light hauling and compartment for holding forms, records, etc. *Flinchbaugh Co.*

Rail Flaw Detector (RA-2)

A completely transistorized portable rail-flaw detector is available. Known as the Model TR-10, it weighs only 5 lb and consists of an adjustable handle equipped with a transducer at one end, a meter at the other, and a headset for the operator. The transducer is slid along the rail and when a flaw is encountered it sends visual signals to the meter and audible signals to the headset. *Branson Instruments, Inc.*



Support Bearing (RA-3)

After tests under a wide range of conditions, the new EMD flange lubricated traction motor support bearings are said to have shown a considerable reduction in bearing wear. Felt lubricators, embedded in the flange face and extending into the modified hour-glass bore at four places on each bearing, accumulate the oil and relay it to the thrust surfaces when the wheel or gear hub contacts the felts. *Electro-Motive Division.*

Boring Machine (RA-4)

The Ka-Mo G-160, a gasoline-powered horizontal boring unit capable of boring 36-in.-diameter holes, consists of a 52-hp air-cooled gasoline engine, hook rollers and engine base, three-speed transmission and gear reduction with clutch, 9 gpm hydraulic pump powering the feed mechanism, leveling outriggers, track and connecting plates. Ratings range from 150 ft of 36-in.-diameter hole to 200 ft of 12-in.-diameter. *Kwik-Mix Company.*

RAILWAY AGE WEEKLY

PLEASE SEND ADDITIONAL INFORMATION RELATING TO PRODUCTS ADVERTISED ON PAGES 3 4 6 8 11 12 16 19 21-24 26 27 28 29A 29B 43 44

PLEASE SEND ADDITIONAL INFORMATION RELATING TO PRODUCTS DESCRIBED ON PAGES 33 and 34 MARKED RA-1 RA-2 RA-3 RA-4 RA-5 RA-6 RA-7 RA-8 RA-9 RA-10 RA-11 RA-12

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

8/7/61

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READERS' SERVICE DEPT. (Attention George Johnson)

NEW PRODUCTS REPORT

Reusable Fitting (RA-5)

Hydraulic and pneumatic applications, as well as fuel and lubrication systems, can be served by the Iron Mike, a detachable fitting for high-pressure hose assemblies. It is designed for use with Aeroquip 1509 multiple-wire-braid hose, which is suitable for operation in temperatures ranging from -40 deg F to 200 deg F. Fittings are being produced in ten end-fitting styles for hose sizes ranging from ¼ to 2 in. *Aeroquip Corp.*

Alloy-Steel Shapes (RA-6)

Rolled structural shapes made from quenched and tempered alloy steels are now furnished in standard I-beams, channels and angles, in a wide range of standard sizes and foot weights, and in lengths up to 40 ft. Compositions include USS T-1 and T-1 type A constructional alloy steels; 9% nickel steel for cryogenic applications at temperatures as low as -320 deg F, and HY-80 naval armor steel. *United States Steel Corp.*

Locomotive Lubricant (RA-7)

Application of a colloidal graphite dispersion of petroleum oil, Oildag, is said to have reduced maintenance and expense in diesel locomotive parts replacement on the Green Bay & Western where ½ pt monthly is used on each of 17 locomotives. The dispersion is applied with a coarse brush to vestibule diaphragm or connecting attachments between locomotive units; with a grease gun to coil and elliptic springs. *Acheson Colloids Co.*

Car Vacuum Cleaner (RA-8)

A heavy-duty portable vacuum cleaner, especially adapted for use in preparing freight cars for shipment of food products, chemicals, fertilizers, etc., is powered by a 34-hp gas engine. It develops 7 in. mercury vacuum, handling a volume of air sufficient to allow its simultaneous use by two operators. Two-inch-diameter hoses are recommended for handling heavy accumulations; 1½-in. hoses for more routine cleaning. *Spencer Turbine Co.*

Penetrating Solvent (RA-9)

Lubaid-D is designed to keep moving parts clean and permit free pumping of fuel, passage through ports, nozzles, valves and correct atomization. The solvent's chemical action continues through exhaust system to disintegrate binders that cause formations of sulphates, minerals and ash and helps reduce maintenance of turbo chargers, heat exchangers and waste heat units. Lubaid-D is not an upper lubricant. *Lubaid Co.*

Fiber Insulation (RA-10)

Textrafine insulation, incorporating long chopped textile fibers, is claimed to be particularly advantageous where great dimensional stability is required. Moisture resistant and possessing a high degree of resiliency, it is available in widths up to 120 inches. Textrafine is produced in densities of ¾ lb to 3 lb per cubic foot in thicknesses of ¼ in. to 6 in. *Pittsburgh Plate Glass Co.*

Antenna Cover (RA-11)

Protection for parabolic microwave antennas from the buffeting of severe winter weather can now be obtained with a parabolic antenna cover, cone shaped and made of molded fiberglass. The "Para-Dome" has been designed to withstand wind force of 50 lb per sq ft, with signal attenuation within 0.1 db between 2,000 and 6,200 mc. It is available for use with reflector sizes of 4, 6, 8 and 10 ft with special sizes available on request. *Tower Construction Co.*

Planning Kit (RA-12)

A microwave system planning kit contains the necessary aids and instructions to plot a microwave system. A bulletin tells how to make a preliminary path study, how to plot a microwave path on graph paper, about profile plotting, selection of sites and FAA requirements. Other items in the kit include a color sheet of topographic map symbols, site plan tracing paper, profile paper, a number of graphical plots and a protractor. *Raytheon Co.*

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NAME ..... TITLE .....
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8/7/61

Market Outlook

Carloadings Rise 1.2% Above Previous Week's

Loadings of revenue freight in the week ended July 29 totaled 591,356 cars, the Association of American Railroads announced on Aug. 3. This was an increase of 7,219 cars, or 1.2%, compared with the previous week; a decrease of 22,632 cars, or 3.7%, compared with the corresponding week last year; and an increase of 46,494 cars, or 8.5%, compared with the equivalent 1959 week.

Loadings of revenue freight for the week ended July 22 totaled 584,137 cars; the summary, compiled by the Car Service Division, AAR, follows:

REVENUE FREIGHT CARLOADINGS
For the week ended Saturday, July 22

District	1961	1960	1959
Eastern	81,089	88,604	80,734
Allegheny	93,139	102,306	80,216
Pocahontas	51,376	52,222	47,540
Southern	105,856	107,491	107,413
Northwestern	94,036	100,564	64,471
Central Western	112,222	118,021	108,658
Southwestern	46,419	50,610	47,363
Total Western Districts	252,677	269,195	220,492
Total All Roads	584,137	619,818	536,395
Commodities:			
Grain and grain products	63,774	75,694	53,778
Livestock	2,902	3,502	3,501
Coal	104,481	101,822	99,114
Coke	6,446	6,061	3,360
Forest Products	38,725	39,075	40,662
Ore	55,638	66,989	13,032
Merchandise l.c.l.	27,313	33,770	38,995
Miscellaneous	284,858	292,905	283,963
July 22	584,137	619,818	536,395
July 15	573,306	606,814	585,073
July 8	424,984	457,779	552,313
July 1	533,573	547,893	574,102
June 24	600,001	641,337	697,797
Cumulative total, 29 weeks	15,174,189	17,374,201	17,942,169

PIGGYBACK CARLOADINGS.—U. S. piggyback loadings for the week ended July 22 totaled 10,788 cars, compared with 10,222 for the corresponding 1960 week. Loadings for 1961 up to July 22 totaled 316,754 cars, compared with 304,649 for the corresponding period of 1960.

IN CANADA.—Carloadings for the seven-day period ended July 14 totaled 74,287 cars, compared with 70,436 for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada		
July 14, 1961	74,287	20,445
July 14, 1960	77,124	23,931
Cumulative Totals		
July 14, 1961	1,792,991	667,468
July 14, 1960	1,940,800	785,355

New Equipment

FREIGHT-TRAIN CARS

► *Canadian Pacific.*—Ordered 100 70-ton covered hoppers from Marine Industries.

► *Southern.*—Has asked for bids for construction of 200 4,800-cu ft, 100-ton aluminum covered hopper cars. Delivery is to begin within 60 days at a rate of 40 cars a week. The order will buffer a fleet of 1,250 such high-capacity aluminum cars put in service last year.

PIGGYBACK

► *Milwaukee.*—Will acquire 25 piggyback flat cars and 100 Flexi-Van trailers through lease arrangement with Strick Trailer. Deliveries will begin Sept. 1.

► *Trailer Train.*—Directors authorized purchase of 600 new cars for third-quarter delivery. Order will include both piggyback cars and cars designed for auto-rack service.

LOCOMOTIVES

► *Iran.*—Has been granted a $3.5-million loan by the Export-Import Bank of Washington to finance the purchase of 16 diesel-electric locomotives from General Motors. The bank has made three previous loans to Iran totaling $33 million to finance the acquisition of more than 150 locomotives.

New Facilities

► *Chicago Transit Authority.*—Awarded contract amounting to $204,980 to Abbott Construction Co., Chicago, for construction of steel elevated structure for two storage tracks at 63rd-Loomis terminal of Englewood rapid transit branch. Two 1,100-ft tracks will provide space for 40 cars.

► *Florida East Coast.*—Ordered 89 64/12-volt DC two-way radios from Motorola. Also included are 20 base stations to be installed as part of a dispatcher control radio system along the FEC's 571-mile line.

► *Grand River.*—City of Kitchener, Ont., and Grade Crossing Fund financing diversion of main line at Kitchener. Project involves laying two and one-half miles of new track.

► *Louisville & Nashville.*—Will spend $232,458 for hot-box detectors at six locations: Okawville and Carmi, Ill. on the Evansville, Ind.-East St. Louis, Ill., line; Springfield, Tenn., Guthrie, Slaughters and Sebree, Ky., on the Evansville-Nashville, Tenn., line.

► *Missouri Pacific.*—Will expand recently-completed North Little Rock Yard by addition of 16 classification tracks to the existing 40-track class yard. Diesel facilities will also be expanded. Yard is the principal classification point for through traffic moving via MP's main line between St. Louis and Texarkana and Texas points (RA, May 8, p. 12).

(*Continued on following page*)

Market Outlook CONTINUED

► *Western Pacific.*—Ordered equipment from Union Switch & al Division of WABCo. for installation of CTC on 23 miles of n line between Oroville and Portola, Cal., that is to be relocated ause of the construction of the Oroville Dam by the state.

► *New York Central.*—Purchased seven Automobile Loaders from k Equipment Corp., Cincinnati, for $37,100. The stationary units our for Chryslers, three for Cadillacs—have been installed at roit. They are adjustable for bi- and tri-level loading.

► *Union Pacific.*—Ordered a 240-channel, 6,000 mc microwave em, type 74B from Lenkurt Electric Co., to be installed between Lake City and Cheyenne, 400 miles. The system will have 13 eater stations.

EIGN

► *Pakistan Western Railway.*—Plans to begin work soon on a rail line from Kot Adu southward to Kashmore, 200 miles. First se of construction, from Kot Adu to Dera Ghasi Khan, will cost estimated $14.7 million.

Maintenance Expenditures

► *Down 7.4% in May.*—Expenditures by Class I roads for maintance of equipment, way and structures in May were down about million, compared to May 1960, according to report of AAR eau of Railway Economics summarized below:

	May 1961	May 1960	% Change
tenance of Way and Structures	$ 97,714,691	$107,263,833	—8.9
tenance of Equipment	141,939,277	151,658,711	—6.4
s	239,653,968	258,922,544	—7.4

urchases & Inventories

► *Four Months' Purchases Down 16.8%.*—Purchases by domestic roads of fuel, material and supplies in this year's first four months e $87,691,000, or 16.8%, lower than in the comparable 1960 iod. Purchase and inventory estimates in following tables were pared by Railway Age.

	April 1961	Four Months 1961	Four Months 1960
CHASES*	(000)	(000)	(000)
	$ 3,521	$ 12,273	$ 28,527
sties	3,158	14,653	17,888
r Material	72,221	290,243	343,913
	26,657	116,016	130,548
	$105,557	$433,185	$520,876

ject to revision.

ENTORIES*†	April 1, 1961	April 1, 1960
	(000)	(000)
	$ 49,622	$ 59,882
sties	82,335	77,987
r Material	369,543	404,155
p	23,232	24,547
	21,481	19,860
	$546,213	$586,431

ject to revision.
total inventory figures taken from ICC statement M-125 for month indicated.

AirJet Cars Will Handle Bulk Commodities

The AirJet, a tank-type car designed for discharging bulk materials by air pressure directly into storage bins or highway vehicles, will be produced and marketed cooperatively by Pullman-Standard and the Halliburton Co. of Duncan, Okla.

The prototype car, which is a 2,400-cu-ft unit of 70-ton capacity, was recently placed in service by Halliburton for moving the cement and fly ash used in its oil-well cementing operations (RA, May 8, p. 14; July 31, p. 43).

The pneumatic system and tanks used on the car has been used on trucks and barges for more than ten years. The prototype car has successfully handled products ranging in density from 16 to 168 lb per cu ft. Tanks are ASME coded at 40 psi, and unloading is accomplished with air pressures in this range, using a relatively low volume of air.

While the prototype car has three of the Halliburton 800-cu-ft, tear-drop-shaped tanks, it is possible to build cars with longer underframes to accommodate more of these tanks if lower density materials are to be handled. The tanks can be coated on the inside to handle foodstuffs and chemicals, either granular or liquid.

Unloading requires only a hose connection to the car and a supply of compressed air, thus eliminating the need for any intermediate transfer systems between the car and storage bins. Because of the patented aeration jet system, tanks are virtually self-cleaning. This reduces materials waste and the possibility of contaminating subsequent loads.

One man has been able to completely unload the car in 30 minutes directly to storage bins or silos without interfering with plant operation. This is about one-third the time required for several men to unload one conventional covered hopper.

AirJet cars can be purchased outright, or may be leased from Transport Leasing Co., which is a Pullman Inc. subsidiary.

Current Publications

CUSTOM HOUSE GUIDE, 1961 edition. Custom House Guide, Box 7, Bowling Green Station, Custom House, New York 4. $30, plus postage (including 12 monthly issues of the American Import and Export Bulletin).

INDIAN RAILWAYS; A STUDY IN PUBLIC UTILITY ADMNISTRATION, by Amba Prasad. Asia Publishing House, distributed in U.S. by Taplinger Publishing Co., Inc., 119 West 57th st., New York 19. $7.95.

Hutchinson Urges Coordination

► **The Story at a Glance: "The future of the railroads depends more on what the industry does than on what regulatory agencies do"; "the real key" to that future lies in "complete combination of services with all existing modes of transport." So ICC Chairman Everett Hutchinson told the New York Society of Security Analysts on July 28, in a luncheon address in which he conceded that "there is a job for government, too."**

"Common sense and self-interest seem to suggest" that railroads make more joint-rate and through-route arrangements with independent motor carriers. The implication that such rates and routes—like the new Plan V TOFC tariff between the New York Central and a New Jersey trucker (RA, July 31, p. 7)—could win regulatory approval was conveyed to New York financial analysts in a July 28 talk by Everett Hutchinson, chairman of the Interstate Commerce Commission.

Such rates, Mr. Hutchinson said, "would mean further substantial gains for the industry. They would provide flexibility where none exists, and generate new traffic at numerous inland points. It may well be a question of 'publish or perish'—for there may be no other effective, practical way to stem the rising tide of traffic moving in private and exempt trucks and in so-called 'gray area' operations. . . . Evidence of demand for such a flexible, coordinated service is in sight on every hand. Response to [it] will, to a considerable extent, shape the future of the industry . . . [which] depends more on what the industry does than on what regulatory agencies do."

The ICC chairman "reminded" his audience that "there are no restrictions against use of joint facilities in providing coordinated service. Present limitations are on ownership, not service. Integrated ownership may come, but coordinated service should come first. . . . Full coordination is needed now to provide the type of flexible service the public has a right to expect. If coordination, complete service, is not provided—if the industry does not help itself—shippers may be expected more and more to roll their own—in private and exempt trucks."

"There is," Mr. Hutchinson conceded, "a job for government, too. There should be equality in our regulatory laws. The federal excise tax on passenger travel should be repealed. State and local taxing authorities must cease looking upon railroads as fat sources of tax revenue. Little used passenger service that is unprofitable ought to be discontinued. Service for which there is a demand should be improved. Agricultural and dry bulk commodities exemptions should be eliminated."

The railroads, he also agreed, have done more "within the past few years by way of modernization and improvement than in any comparable period in history." But with "many roads that have applied scientific advances to the fullest extent not well off," he urged "casting concepts of buffalo and Indian days out of industry thinking—discarding the last vestiges of thinking which would have the industry regard past status as some sort of privilege for the future—doing a better job for the shipper's dollar.

"As the dominant mode of transport railroads should take the initiative in making transportation a functional, flexible system rather than a collection of separate, exclusive parts."

AWO Fights Grain-Rate Cuts

Suspension of reduced rail rates on grain moving in multiple-car lots between points in Southern Territory has been asked by the American Waterways Operators in a petition filed with the ICC. The rates have been published to become effective Aug. 10.

The proposed rates, initiated by the Southern, would apply on all types of grain moving in multiple-car lots of 450, 900, and 1,800 tons from St. Louis and East St. Louis, Evansville, Louisville, Cincinnati, and Memphis to many points throughout the South. The reductions range from 60% to 65% below present carload rates.

AWO claims the low level of the proposed rates would destroy the barge movement of grain on the Ohio and Tennessee Rivers. It would thus nullify, says AWO, a recent decision of the U. S. District Court for the Northern District of Alabama (Arrow Transportation Co. v. United States) which was affirmed by the Supreme Court. This decision held that railroads may not lawfully impose such high charges on ex-barge grain moving from Tennessee River ports to interior southern points as to prevent barge-rail service from competing effectively wtih all-rail service to the same destinations. The court ordered the ICC to prescribe either ex-barge proportional rates from river ports or, in the alternative, joint barge-rail rates at a level which would enable the water carriers to continue to participate in the traffic.

The AWO petition says that the newly proposed multiple-car rates, without any corresponding reductions in ex-barge rates, would defeat the objective stated by the court in the Arrow decision.

Meanwhile, a unanimous resolution dated Aug. 1 in support of the reduced grain rates proposed by the Southern was filed with the ICC by the Southern Governors' Conference and the Southeastern Association of Railroad and Utilities Commissioners.

Cover Story

The Railway Age cover last week was just about as unusual—from a publishing and printing standpoint—as are the aluminum tank-hopper cars it illustrated. A number of readers have asked about the cover. It is actually white and four-color printing over aluminum foil, laminated to conventional paper. The white area is not paper, but white ink printed over the aluminum foil. While the technique is common in the production of beer-bottle labels, it is, to my knowledge, one of the first applications of its kind by an industrial publication.

We presented the Alcan car on the cover of the July 31 freight traffic issue this way to dramatize the promises explicit in recent new-car designs for both railroads and shippers. The story inside, "New Trends in Car Design," illustrated other pace-setting equipment of designs which will very likely figure importantly in future car-buying programs of the railroads.

Because the printing job was a technical achievement which attracted so much attention, we'd like to say thanks to Aluminium Ltd., who obtained the picture for us; to A. D. Steinbach & Sons, New Haven printers who did the five-color work; and to our regular printer, Wilson H. Lee, Orange, Conn., who took special protective measures in binding and mailing.

Robert S. Lewis

PUBLISHER

REB Offers Supervisors' Course

The Story at a Glance: Railroad supervisors interested in improving their chances for getting ahead now have a new self-help tool at their disposal—a two-year, 24-unit instruction course in supervision, prepared and published by the Railway Educational Bureau, Omaha, Neb.

The first half of the course deals with human relations aspects of supervision; the second half treats the more material phases of the job.

Effective supervision, as the Railway Educational Bureau points out, demands a dual skill on the part of the supervisor. He must know his specific job field; but he must also know the science of human relations in the practice of supervisory duties. It's the failure to recognize this latter point, REB contends, that frequently causes the downfall of supervision and the supervisor—and it's the same point, the so-called "man problem," that gets primary emphasis in the Bureau's new course on supervision.

Success under present-day conditions, REB notes, "is seldom the result of individual achievement. In the great majority of cases it rests on the ability to direct and coordinate the work of many men . . . Even though a man is responsible for the direction of only a few other men, he cannot hope for success unless he understands the human side of supervision—the man problem."

To this end, the two-year REB course devotes half its material — 12 units — to an analysis of general considerations underlying a railroad supervisor's work, a consideration of the qualities a man should make of his own personal characteristics, and a series of papers on the human relations aspect of supervision.

In the second year of the course, supervisors (or those preparing for supervisory work) are taken into the material phases of their duties: Costs and money values, methods of analyzing work, planning and scheduling of work, routing and dispatching of work, standards and standard-practice instructions, and the use and analysis of records. The course closes with discussions of methods of day-to-day supervision, promotions and other related matters.

"A man can't learn to be a railroad supervisor out of a book," REB Director B. C. Walters comments. "But there are many principles and techniques which can be learned only from books, and as a man has the rare opportunity of working with another man who knows these techniques and also knows how to teach them.

"The ideal system of learning is to combine book study or lectures with on-the-job experience. Neither books nor experience can do half the job that the two can do together."

(REB offered a supervision training course once before, in the 1930s. Some 4,800 railroad men studied that earlier course and, Mr. Walters notes, "their job progress is documented in the Bureau's files.")

The new course will be made available to individuals and to railroads for their employees. It's arranged so subscribers receive a unit per month over a two-year period. Reading and absorbing the basic material presented is a major part of the course—but the supervisor is also called upon to do definite constructive work, in the form of written work to be submitted to REB for analysis and comment. Study periods for each unit, REB estimates, will run about six hours.

Truckers Win Cement Rights

The Interstate Commerce Commission has granted authority to 14 trucking companies to transport cement from 25 producing plants in Maryland, Pennsylvania, West Virginia, and the District of Columbia to various destinations along the Eastern Seaboard. The companies are all independent motor common carriers, except for the Black Diamond Transport Co., a trucking subsidiary of the Lehigh Valley.

For many years, the railroads carried virtually all of the cement traffic at issue, according to the Commission's report. The situation changed radically in 1958, however, due to the advent of the pneumatic tank trailer. This effectively nullified many of the inherent advantages of rail service and led, the report said, "to an increasing number of requests by cement consumers for the added benefits of motor service."

Some 40 operating authority applications filed by 19 trucking companies were considered by the ICC in Docket No. MC-27817 (Sub-No. 35). The ICC says this was primarily in response to increasing pressures imposed upon the cement producers by their customers to institute a motor carrier service economically competitive with rail service.

"We are called upon," the Commission said, "to evaluate the fundamental transportation requirements of a large basic industry in the area here under consideration, and to develop an integrated and sound transportation system adequate to meet the expressed need for motor service in the movement of cement."

Railroads protested the applications by contending that there was no need for the proposed motor services, but that if the Commission concluded otherwise, the railroads' motor carrier affiliates should be granted unrestricted rights. Of the rail-owned applicants actively seeking competing operating rights, the Commission granted only that filed by LV's Black Diamond. The Commission found that LV's unsatisfactory financial condition, considered in the light of its dependence upon cement traffic revenue, would force the railroad to curtail some services if it lost the traffic.

Simple Computing Devices Find 'Weight Break Point'

Two simple graphic computing devices have been designed to find the weight break point in load and less-load shipments. The devices, developed by Military Traffic Management Agency (MTMA) traffic specialists and transport economists, are being distributed to military transportation officers.

The "Instant Weight Breaker" rapidly and graphically computes the rate at which it becomes more economical to move small shipments under load minimum weights at load rates rather than at less-load rates. It does this by solving the "break-point equation" (load rate times load minimum weight divided by less-load rate equals break-point weight). The shipper is thus better able to identify his opportunities for consolidating shipments.

The pocket-portable "Instant Weight Breaker" resembles a clock dial, with two revolving arms for scale settings.

On the "Criss-Cross Weight Breaker," the solution to the "break-point equation" is read off a nomogram the size of a desk blotter. This computing diagram lists less-load and load rates and load minimum and break-point weights on opposite sides of the chart, with a connecting diagonal line. The break-point weight is determined by manipulating a straightedge to reflect the applicable load rate, less-load rate, and minimum weight settings.

ATSF FEARS MONOPOLY IN WEST (Con inued from page 10)

monopoly conditions within railroad transport on routes as important as those along the Pacific slope and the central transcontinental route." Without the continuance of at least two-company competition in the railroad industry wherever traffic volume justifies such a market structure, he added, "it is very doubtful that railway progress would continue as rapid as in recent years. In every mode of transport there are market areas in which intermodal competition is ineffective or relatively so; in all such cases, the stimulus to modernization, service improvement and cost and rate reduction must come from the maintenance of a competitive structure for intramodal transport."

- Maurice Fulton, partner in an organization which makes plant location studies for industrial clients, backed Santa Fe's argument that competition benefits industrial development efforts. To many companies seeking industrial sites, he said, "service by more than one railroad is essential."
- A Santa Fe-WP tieup would present substantial opportunity for economies, according to summaries of studies presented by ATSF Trainmaster J. C. Davis. Studies in four areas—coordinations of Stockton-Bay Area operations, of mechanical departments and of car supply, plus studies of WP use of welded rail—show potential savings of $4,859,547 recurring annual savable expenses and earnings and $12,464,406 net cash expenditures avoided.
- Pierre R. Bretey, partner in charge of analyzing rail securities for Hayden, Stone & Co., said Santa Fe's stock exchange offer (1¼-for-1) "would appear, from the point of view of the Western Pacific stockholder, to be eminently fair and reasonable and certainly more realistic than the offer of Southern Pacific." He cited two reasons why the ATSF proposal is important to Santa Fe and to its shareholders: "Protection of Santa Fe's traffic position in central and northern California; and (the fact that) Western Pacific is a good property with great future potential."

Santa Fe was scheduled to complete presentation of its direct case Aug. 3, after which the hearing will be in recess for about two months. The tentative timetable calls for reconvening Oct. 2 in San Francisco, to hear testimony from WP and to cross-examine carrier witnesses.

Editors Afield—PR Men Skirmish Behind Scenes

San Francisco—One of the great untold (as yet) stories of the Santa Fe-Southern Pacific-Western Pacific struggle in the West is the public relations skirmishing that preceded the opening of hearings last month in San Francisco.

One PR man who was through it all commented wryly that "the anecdotes alone would fill a book"—and the less sprightly parts of the story would probably make up a couple more volumes of a manual on public relations practice.

Nobody seems quite sure what weight—if any— the masses of "support" letters, petitions and resolutions will swing with ICC Examiner Paul Albus. SP wound up with an edge in numbers—but hundreds of organizations are supporting each side, and there's no real clear-cut margin of "victory." Besides, as one practitioner noted, all the support expressions didn't come as spontaneous outpourings of opinions or sentiment. Most came as a result of hard work by the PR representatives on both sides.

In the anecdote department, there are cases of organizations hearing one side, voting that way; then hearing the other side and reversing the vote. There's supposed to be at least one case on record where a group voted for Side A, then heard Side B's pitch and voted for Side B, and finally heard a Side A rebuttal and switched back again.

And the ironic part of it is, as one observer looks at it, that a great, great many of the people who have filed in support of one side or the other don't really stand to gain or lose much no matter who wins control of Western Pacific. It's apparently just a reflection of the old American tendency to get on the record—one way or another.

Still and all, the control fight has spread out in the West, a public relations panorama—ample testimony to the effective work top calibre PR staffs can do (and both sides are well stocked with them).

At the moment, with SP's case in and Santa Fe's nearing completion, confidence remains high on both sides. Most opinion holds that WP is almost a sure bet to lose its independence (one observer close to the WP scene sees perhaps one chance in five that the status quo will be maintained and that neither SP nor Santa Fe will win favor with the ICC). But nobody—yet—is ready to guess, with any degree of firmness, whether it'll be SP or Santa Fe that picks off the small but juicy plum that WP has become.

At one time, years ago, there probably wouldn't have been much doubt of the outcome. But Southern Pacific, the old "Octopus" so cordially disliked in California in the early days, has done an effective job of burying that black public image—even though SP, with its full house of railroad, trucking and pipeline interests, is still *the* giant of transportation in the state. Santa Fe is plugging hard at that very fact—and warning repeatedly of monopoly dangers should SP win WP. SP, meanwhile, is taking its own digs at Santa Fe's image—and "Santa Fe All the Way" has been cited (fearfully) more than a few times as witnesses shed anticipatory tears for the Ogden-Salt Lake City gateways should ATSF take over WP. So SP denies it could have a monopoly and Santa Fe denies it would dry up the Utah gateway traffic. And this combination legal-operating-traffic-PR battle rocks along to a conclusion who knows when.

After Santa Fe completes its case —August 3, according to the timetable—the lawyers will have about two months to sharpen up for what promises to be biting cross-examination of railroad witnesses. With luck, the hearings phase of the control case may be wrapped up by year's end—and then it'll be up to Examiner Paul Albus to start threading his way through the masses of conflicting testimony, to reach some decision (preliminary, to be sure) as to Western Pacific's future.

Hovering over the proceedings, of course, is the Justice Department's outrage at the whole thing: Justice's request that the ICC dismiss the rival applications and order divestiture of WP stock by the applicants and several of their supporters. But if that one's worrying anyone, it isn't showing. —Gus Welty

You Ought To Know...

A 5% differential in favor of sea-land carriers has been prescribed by the ICC in a case involving all-rail rates on synthetic plastics and plastic sheets moving from points in Texas to points in eastern territory. Last week, the Commission upheld rail TOFC rates on a parity with sea-land rates in a case involving piggybacking of books between Camden, N. J., and Dallas, Tex. (RA, July 31, p. 52).

Railroads carried 26,881,135 passengers in coaches and an additional 2,191,400 in parlor and sleeping cars during this year's first quarter—down 3.3% and 14.7%, respectively, from the corresponding 1960 period.

Illinois Terminal will abandon 42.59 miles of its main line between Decatur and Kenwood, Ill., and acquire trackage rights over IC between Decatur and Staley, Ill. Terminal will build a 380-foot line to connect with IC at Decatur.

A profitable second half is expected by Chicago & North Western and "if the economy continues to strengthen the company could have a substantial profit for the year as a whole," according to Chairman Ben W. Heineman and President C. J. Fitzpatrick. C&NW posted a loss of $2,847,507 (before special credits) for the first six months of the year.

Last passenger coach on the Bangor & Aroostook (now operated in BAR's fast mail train between Northern Maine Junction and Caribou) will come off if the Maine PUC grants the road's petition. The lone remaining car makes one round-trip daily. In June it carried an average of three revenue passengers a day northbound, five southbound. BAR's neighbor, Maine Central, stopped all passenger service Sept. 6, 1960.

Steadman Industries, Ltd., which recently developed a simplified method for handling van-sized containers (RA, April 24, p. 49), last week announced its "full-scale entry" into the manufacture of containers themselves. "At one time," commented President W. J. Steadman, "we thought our company would concentrate on its patented transfer system, but the wide interest stirred up by the system's introduction and the immediate prospects for container sales makes our move the only logical step."

Dial telephone service is being extended to branch lines of the Northern Pacific in Minnesota, Montana and North Dakota. The new service will provide stations on these lines with direct distance dialing onto NP's system-wide DDD.

Intercity freight tonnage hauled by trucks was 3.4% higher in May 1961 than in the corresponding months of 1960 and 12.2% above April 1961, according to American Trucking Associations, Inc.

Fifty pick-up trucks, replacing open-deck track motor cars, are being put into m/w service by Erie-Lackawanna. The one-ton GMC's, each with cab for six men, have auxiliary flanged wheels and are fitted with seven-foot plow blades which can be used to clear debris, push earth, or remove snow. Road already has 23 similar units in service (RA, Jan. 9, p. 32).

Rail transport problems in material handling and their potential solution, in some areas, through standardization will be examined along with similar air, marine, and motor freight problems during the 12th National Conference on Standards to be held Oct. 10-12 in Houston, Tex. The three-day meeting is sponsored by the American Standards Association.

Waterside sites continue to attract industrial plants, according to American Waterways Operators. AWO's latest tabulation shows 249 new waterside projects so far in 1961—twice the mid-1960 figure of 122.

Railroads are operating under "emergency conditions" and urgently need the liberalized property and equipment depreciation terms provided in H.R. 231, the Transportation Association of America has told the House Ways and Means Committee. TAA noted that capital expenditures for 1961 "will be nearly one-third off from 1960 levels."

Frisco's combination superintendent-district manager sales job on the Central Division at Fort Smith, Ark. (RA, June 5, p. 12) took a new twist Aug. 1. Joe F. Christian, an operating man who held the dual job since January 1960, moved on to become superintendent at Amory, Miss. His successor at Fort Smith: T. M. Mabon, who had been district manager sales at St. Louis for three and a half years before moving to Fort Smith as assistant superintendent last June.

UP's new gasoline extraction plant at Bitter Creek, Wyo., is now in operation. The $3,250,000 installation processes some 28,000,000 cu ft of gas daily from the Patrick Draw and West Desert Springs oil field. It is also designed to recover gasoline, propane and butane from the gas produced from the oil wells.

"A redefinition of a national transportation policy" is sought in a bill, H.R. 8364, introduced by Rep. Abner W. Sibal (R.-Conn.). The bill provides that the Secretary of Commerce submit to the President and Congress by June 30, 1963, recommendations for action to assure that each mode of transportation "(a) will be able to compete reasonably with each other form of transportation . . .; (b) be able to maintain itself in healthy economic condition . . .; and (c) be enabled to fulfill the needs of its users."

The new in-dialing "Centrex" telephone system went into operation at Canadian National headquarters offices Aug. 6. The system enables callers to reach directly the person they desire to contact without having to go through a switchboard.

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Costs for Competition

Among the various factors bearing on the future of the railroads, none is more important than that of establishing their competitive rates on a basis of sound economics. The railroads' competitors insist that competitive rates should have "fully distributed costs" as a floor. This doctrine is completely erroneous, and the reasons why it is so are important for every railroad man to know, and to be able to explain. A simple hypothetical case is cited to illustrate this point, in the report, "Cost Finding in the Transportation Industries," by R. L. Banks & Associates to the Commerce Department. In summary, here is the situation:

There's a small railroad that runs 100 miles from a big mine at A to a connection with a larger railroad at B. The only traffic on this railroad heretofore has been iron ore—750,000 tons annually, and the small railroad's share of the rate has been $1.50 a ton.

LOW RATE, INCREASED PROFIT

Total revenue has, thus, been $1,125,000. Tons per loaded car have been 75; tare weight, 25 tons; carloads, 10,000, and gross ton-miles, 100,000,000.

Expenses have been: M/W, $250,000; M/E, $175,000; transportation, $400,000; other (traffic, general, and taxes), $175,000—total expenses $1,000,000, leaving a profit of $125,000. Unit costs at this volume have been: Per net ton, $1.33; net ton-mile, 1.33¢; gross ton-mile, 1¢; carload, $100.

Now, an opportunity has arisen adjacent to the mine at A to use 75,000 tons of coal annually which can be obtained at B. A heavy-duty truck operator figured that he could move the coal profitably at $1.10 a ton. The railroad said it could handle the coal profitably at $1 a ton. The truck operator contended that a railroad rate of $1 would be non-compensatory, since (as the figures in the preceding paragraph show) its unit costs per net ton on the traffic it has been handling have been $1.33 per ton. But the $1 rate on the coal would be compensatory, the railroad insists, and sets forth the figures in the accompanying table.

What these figures plainly show is that the railroad—after defraying all the increased expense from the additional traffic—would be money ahead by handling this traffic at $1 per ton. Certainly any traffic which increases net profit cannot be considered to be non-compensatory.

The additional—or marginal, or out-of-pocket—cost of handling the coal is 82.7¢ per ton. The "fully distributed cost" of the ore traffic alone has been $1.33 per ton—but if the railroad tried to levy that charge on the coal, it would not get the coal business. It would lose $13,000 in increased profits; and the coal shipper would have to pay 10¢ more per ton ($7,500, in all) to get his coal hauled by truck.

The ore shipper is not in any way harmed by seeing the railroad pick up this extra money. Indeed, if the railroad could find a few more tons of coal at the $1 rate, it could even afford to cut its rates on ore slightly. If it could develop its coal business from B to A to equal ore tonnage from A to B, it could afford to cut its ore rates substantially.

It is commercially and economically sound for a railroad to establish rates on any commodity at "fully allocated costs," or more, if doing so does not chase away the business. It is unsound economics and bad business, for either a railroad or its customers, if the railroad turns away added tonnage that will pay more than its added costs, while not reducing earnings on existing tonnage.

It should be the function of regulators to encourage pricing which will: 1) save money for consumers and 2) get transportation work done at minimum added expenditure. Allowing competitive rates to go down to a "floor" of added (or marginal, or out-of-pocket) costs protects the public interest in economical transportation. Using "fully allocated costs" as the minimum results in wasteful expenditure and in higher costs of transportation to the shipping public.

Railroad men need to understand the important distinction between "fully allocated" and "direct" or out-of-pocket costs in competitive rate-making. This is the first and necessary step toward securing general recognition of this distinction on the part of regulators and the influential public. So far, the railroads have been more successful in controlling their costs than they have been in using their low costs effectively to hold and increase their traffic.

Traffic & Revenue	*Ore Only*	*Ore & Coal*	*Net Increase a/c Coal*
Tons handled	750,000	825,000	75,000
Carloads	10,000	11,000	1,000
Gross ton-mi. (000)	100,000	110,000	10,000
Revenue	$1,125,000	$1,200,000	$75,000
Expenses			
M/W	$ 250,000	$262,500*	$12,500
M/E	175,000	192,500*	17,500
Transportation	400,000	430,000*	30,000
Traffic & General	150.000	150 000	....
Taxes	25 000	27,000	2,000
Total	$1,000,000	$1,062,000	$62,000
Profit before inc. tax	$ 125,000	$ 138,000	$13,000

*Based on M/W expense being considered 50% variable, M/E 100% and Transportation 75%.

Unit Costs	*Ore Only*	*Increment from Coal*	*Combined Traffic*
Per net ton	$1.33	82.7¢	$1.29
Per net ton-mile	1.33¢	0.827¢	1.29¢
Per gross ton-mile	1.00¢	0.62¢	0.96¢
Per carload	$100	$62	$96.55

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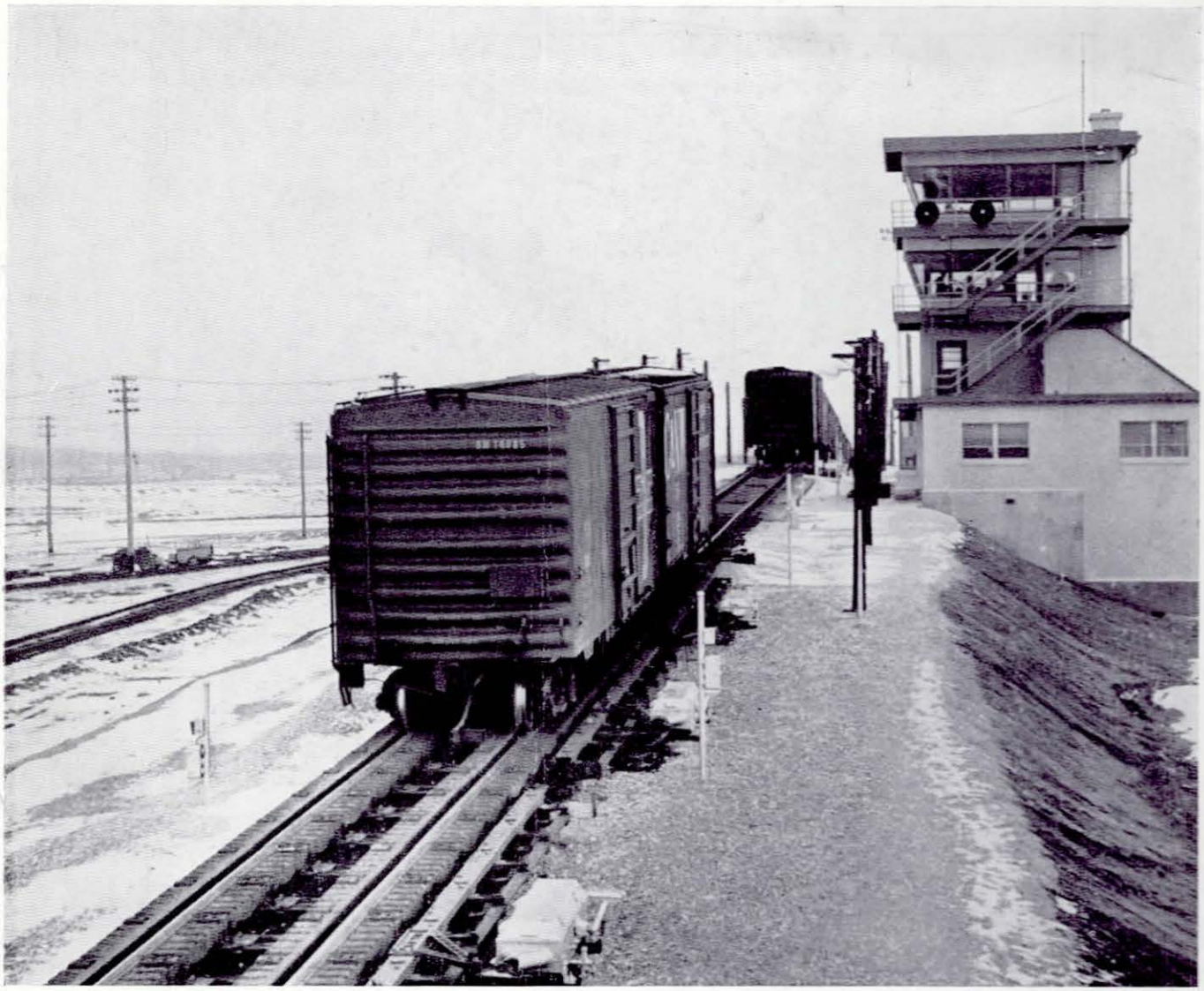

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